USER GUIDE: HCUP SUPPLEMENTAL VARIABLES FOR REVISIT ANALYSES

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INTRODUCTION

The Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) databases capture information on inpatient, emergency department (ED) and ambulatory surgery and other outpatient service encounters in U.S. community hospitals. These databases are often characterized as being "discharge-level" files, meaning that each record in a database represents one discharge abstract from a hospital setting, which can be an inpatient stay, ED visit, or ambulatory surgery or other outpatient service encounter. Thus, if the same individual visited the hospital multiple times in a given year, the HCUP databases would include separate records in the respective HCUP database for each inpatient stay, ED visit or ambulatory surgery or other outpatient service encounter. Many times researchers may be interested in knowing how many visits a distinct patient had rather than simply the number of overall hospital visits. Studying multiple visits is becoming increasingly common as hospital readmission rates are important indicators of the quality of medical care. To facilitate analyses that focus on multiple hospital stays by the same person, AHRQ created a set of supplemental variables that can be linked to the HCUP State databases to track multiple (repeat) patient visits in the hospital setting while adhering to strict privacy regulations. This user guide discusses the methodology used to develop these supplemental variables and how the information can be used with the HCUP State databases. Appendices provide detail on which States, databases, and years are available, in addition to verification statistics. Several SAS coding excerpts are also provided to facilitate the use of these files.

From data year 2003 to 2008, supplemental files called "HCUP Supplemental Files for Revisit Analyses" (herein referred to as the "Revisit Files") were created to include the revisit variables designed to augment the HCUP State databases. Beginning with 2009 data, the variables previously included in the Revisit Files are included in the Core file of the HCUP State databases, when possible. The supplemental variables were labeled "revisit" rather than "readmission" intentionally. The term "revisits" implies multiple healthcare encounters for a particular patient that are not limited solely to inpatient stays. Most healthcare research on hospital *readmissions* has focused solely on the inpatient setting – i.e., tracking multiple hospital admissions in the inpatient setting by the same person. The HCUP revisit variables expand on traditional readmission analyses by allowing researchers to study multiple patient visits to the hospital, regardless of the setting of care. In other words, these supplemental variables enable more than identification of hospital readmissions – they also enable tracking of patients admitted to the hospital following an ambulatory surgery or an ED visit and patients who made multiple trips to the ED. Note that revisits may occur for any reason (i.e., they may not be related) and can be separated by days or years. The determining factor in classifying healthcare events as revisits is that they represent services for the same individual.

In contrast, readmissions are sequential hospital admissions for a related reason, and usually within a specified time frame. Studying readmissions can be difficult as researchers must understand whether patients are admitted for expected follow-up treatment, or, conversely, for unexpected complications. In addition, multiple hospital visits for the same patient may, in fact, be unrelated – and, therefore, not considered a "readmission." Identifying readmissions requires specific criteria for the inclusion of events, such as type of condition and appropriate elapsed time. For example, a study of readmissions for congestive heart failure (CHF) may require that the principal reason for the hospitalization, ED visit, or ambulatory surgery is related to CHF and may also require that the time elapsed between events is no longer than a predetermined number of days. The HCUP revisit variables contain key information, such as the days between multiple visits, that can assist analysts in making informed decisions about whether repeat patient visits qualify as readmissions.

The HCUP revisit variables, used in combination with HCUP State databases, enable analysts to link hospital visits that belong to a unique person, determine the elapsed time between visits, and evaluate valuable clinical information on the HCUP record. These revisit variables afford analysts the flexibility of performing patient-level analyses within and across hospital settings and time periods, without compromising patient confidentiality. Finally, these data elements allow the analyst to determine their definition of a readmission or revisit for the purposes of their study. This User Guide documents the creation of the revisit variables and provides guidance on how to best utilize them in revisit analyses.

HCUP Databases

HCUP develops and maintains a family of healthcare databases, related software tools, products, and support services. HCUP features the largest collection of multi-year hospital care data in the United States, containing a wealth of all-payer, encounter-level information beginning in 1988. AHRQ relies on vital partnerships among Federal, State, and Industry associations to produce HCUP resources. HCUP databases integrate the data collected by state governments, hospital associations, private data organizations, and the Federal government to create a national health care information resource of inpatient, ED, and ambulatory surgery and other outpatient services data.

The HCUP revisit variables are designed to be used exclusively with the HCUP State databases:

- The State Inpatient Databases (SID), which contain inpatient discharge records from community hospitals in participating States
- The State Emergency Department Databases (SEDD), which contain ED visit records from hospital-owned EDs in participating States
- The State Ambulatory Surgery and Services Databases (SASD), which include data from ambulatory surgery and other outpatient service encounters from hospital-owned and sometimes nonhospital-owned ambulatory surgery facilities.

Note: HCUP revisit variables are available for some, but not all, State databases – SID, SASD, and SEDD – starting in calendar year 2003. Appendix A lists the availability of the revisit variables by State, database, and year.

It should be noted that revisit variables are found on one HCUP Nationwide database, the Nationwide Readmissions Database (NRD), which is sampled from SID with revisit variables. However, the NRD includes further re-identified versions of the revisit variables and therefore, records are unable to be linked back to the SID. The NRD can be used to generate national estimates of readmissions within a single calendar year. Each year of the NRD must be considered as a separate sample as neither patients nor hospitals can be tracked across data years.

HCUP REVISIT VARIABLES

The HCUP revisit variables include only two data elements:

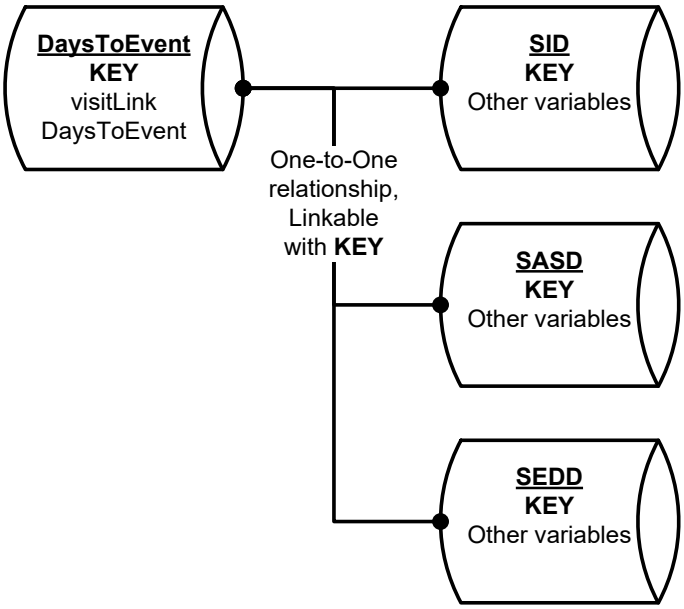
- **visitLink**: linkage variable for all events associated with a unique patient that is assigned during construction of the supplemental revisit variables and based on a unique combination of synthetic patient linkage number, date of birth, and sex

- **DaysToEvent**: the number of days from a randomly chosen "start date" to the admission date for a specific healthcare visit for an individual. The start date is randomly assigned for each unique patient. As a result, **DaysToEvent** will be consistently calculated for all a patient's linked events, regardless of year (i.e., all visits with the same value of **visitLink**). The **DaysToEvent** variable is assigned during construction of the supplemental revisit variables.

From 2003-2008 the HCUP revisit variables are stored in separate State- and year-specific files (called Revisit Files) that can be linked to the corresponding SID, SASD, and SEDD for that year (Figure 1). For example, for Nebraska there is one HCUP revisit linkable file for the 2006 data year. Researchers can add the **visitLink** and **DaysToEvent** data elements to the 2006 Nebraska SID, SASD, and/or SEDD files by linking on the **KEY** data element. The Revisit Files for data years 2003-2008 are available through the HCUP Central Distributor.

Starting in data year 2009, the revisit variables (**visitLink** and **DaysToEvent)** are stored in the Core file of the SID, SASD, and/or SEDD, so there are no separate Revisit Files.

Figure 1. Relationship Between HCUP Databases



DEVELOPMENT OF THE HCUP REVISIT VARIABLES

Development of the HCUP revisit variables requires the HCUP State databases to contain a unique synthetic patient linkage number which enables tracking of unique patients within and across years. Only some of the HCUP statewide data organizations provide this information to HCUP. Each State employs a distinct methodology in producing their synthetic patient linkage number.

Verified Patient Linkage Number (visitLink)

An instrumental part of constructing the HCUP revisit variables is verifying that the synthetic patient linkage numbers accurately represent a unique person in the HCUP State databases. As part of the verification process, the patient's date of birth and sex are used to qualify the synthetic patient linkage number and uniquely identify a person. A new verified patient linkage number (**visitLink**) is assigned for each unique combination of the qualifying information

(synthetic patient linkage number, date of birth, and sex). Consider the following example: Five records have the same synthetic patient linkage number, but two records have one date of birth and sex, and the remaining three records have a different, but consistent, date of birth and sex. The two records with identical identifying information have one value of **visitLink,** and the other three records have a different value of **visitLink**. Appendix B contains examples of the assignment of **visitLink** for different scenarios.

No verified patient linkage number is assigned if any of the three pieces of information is missing (i.e., **visitLink** is missing). Additionally, no verified patient linkage number is assigned if there are more than 40 hospital visits in a given calendar year with the same qualifying information. This second qualification excludes less than 0.5 percent of the synthetic patient linkage numbers and aims to eliminate synthetic patient linkage numbers used for multiple people. Appendix B contains examples of the assignment of **visitLink** for different scenarios.

While the term "verified patient linkage number" is used to describe the information in the HCUP data element **visitLink**, the values are not recognizable as specific patient information. **VisitLink** does not include the values of the synthetic patient linkage number, date of birth, or sex.

The **visitLink** variable is created each year for all discharges across all available databases for the particular State. For example, if a State provides SID, SASD, as well as SEDD, the **visitLink** is verified for all records across all three databases for that data year and previous years of data, as appropriate.

Calculating the Days to Event (DaysToEvent)

For a verified patient linkage number (i.e., non-missing **visitLink**) with more than one hospital visit, the elapsed days between visits are calculated as the difference between the two visit dates. This information is often useful for determining readmissions for a specific condition (i.e., 30-day readmissions, 7-day readmissions, etc.) While this information is critical for defining readmissions, the use of admission and discharge dates is highly restricted per Health Insurance Portability and Accountability Act (HIPAA) guidelines.

To comply with HIPAA guidelines and ensure patient confidentiality, no "date" information is released on the HCUP revisit variables. A timing variable (**DaysToEvent)** was calculated consistently for each verified patient linkage number (**visitLink**) based on a randomly assigned "start date." Each verified patient linkage number is assigned a unique start date that is used to calculate **DaysToEvent** for all visits associated with that **visitLink** value. The variable **DaysToEvent** is the difference between the visit's admission date and the start date associated with the **visitLink**.

The calculation of days between visits is the difference of **DaysToEvent** between two selected visits for a unique verified patient linkage number (**visitLink**). For example, consider a patient with CHF that has a hospital admission on 1/10/2008 and an ED visit on 1/25/2008. If the **DaysToEvent** value is "9" for the 1/10/2008 admission and the **DaysToEvent** value is "24" for the 1/25/2008 ED visit, then the number of days between the start of the first visit and the start of the second visit is 15 days (24 – 9 = 15). It should be noted that often readmission analyses consider the time between the end of one admission and the start on the next admission. To adjust for the length of the admission, subtract the length of stay from the difference. In the example, above, if the first admission had a length of stay of 2 days then the number of days between the end of the first visit and the start of the second visit is 13 days (24 – 9 – 2 = 13).

The lowest value of **DaysToEvent** will be on the first or earliest event for a patient. It is important to remember that if patient A has a value of 605 for **DaysToEvent** and patient B has a value of 300 for **DaysToEvent**, patient B's event did not necessarily take place prior to patient A's event – in fact, patient B's **DaysToEvent** value has no relation to patient A's **DaysToEvent** value. Because of the use of a random start date in the calculation of **DaysToEvent**, the value of **DaysToEvent** cannot be compared across patients. Appendix B contains examples of the assignment of **DaysToEvent** for different scenarios.

AVAILABILITY OF VERIFIED PATIENT IDENTIFIERS VARIES BY STATE

The availability of verified patient linkage numbers for specific populations and settings varies by State and should be considered prior to any analysis. Table 1 shows the range of the percentage of verified revisit information across 15 States in 2005-2006 for selected patient characteristics, expected payer, and hospital characteristics.

Table 1. Range of Percentage of Records with Verified Revisit Information

		All Events			
		Min	**Q1**	**Median**	**Max**
Overall		65.4%	84.7%	90.5%	100.0%
By Patient Characteristics					
Age Group	0	11.0%	26.8%	49.1%	100.0%
	1-17	35.1%	54.1%	73.3%	100.0%
	18-44	69.5%	92.6%	95.9%	100.0%
	45-64	69.2%	96.4%	97.5%	100.0%
	65+	69.8%	97.2%	98.8%	100.0%
Sex	Male	64.3%	82.6%	88.9%	100.0%
	Female	66.2%	86.6%	91.8%	100.0%
Patient Income	Quartile 1 (lowest)	59.3%	87.2%	91.5%	100.0%
	Quartile 2	66.9%	86.7%	91.5%	100.0%
	Quartile 3	70.1%	86.1%	90.9%	100.0%
	Quartile 4 (highest)	70.5%	83.4%	88.9%	100.0%
Expected Payer	Medicare	69.8%	97.2%	99.1%	100.0%
	Medicaid	55.4%	71.7%	85.9%	100.0%
	Private insurance	66.5%	82.2%	89.4%	100.0%
	Self-pay	66.9%	79.8%	88.2%	100.0%
	No Charge	54.2%	79.0%	86.5%	100.0%
	Other	44.0%	87.6%	93.7%	100.0%

		All Events			
		Min	Q1	Median	Max
Overall		65.4%	84.7%	90.5%	100.0%
By Hospital Characteristics					
Hospital Ownership	Government, nonfederal	72.5%	81.7%	90.5%	100.0%
	Private, not-profit	67.9%	84.7%	90.0%	100.0%
	Private, invest-own	57.5%	86.0%	92.5%	100.0%
Hospital Location	Large central metropolitan	78.0%	82.4%	87.8%	100.0%
	Large fringe metropolitan	36.3%	83.1%	89.2%	100.0%
	Medium metropolitan	74.3%	85.4%	92.0%	100.0%
	Small metropolitan	45.6%	87.8%	94.4%	100.0%
	Micropolitan	69.9%	88.7%	95.4%	100.0%
	Noncore	35.1%	83.4%	94.8%	100.0%
Hospital Bed Size	<100	56.7%	87.1%	92.5%	100.0%
	100-299	68.7%	84.3%	91.1%	100.0%
	300-499	70.1%	89.7%	92.2%	100.0%
	500+	72.7%	84.3%	92.5%	100.0%

Source: HCUP State Inpatient Databases, 15 States, 2005-2006

In most cases, verification rates across patient and hospital characteristics and across selected diagnosis and procedure categories were consistent with the overall verification rates. For example, the first and second quartiles of the verification percentage overall were 84.7 percent and 90.5 percent, respectively. The first and second quartiles of the verification percentage for patients from hospitals in large fringe metropolitan areas were 83.1 percent and 89.2 percent, respectively.

Some notable exceptions include:

- Newborns (age 0) – The median of the verification rates across the 15 states was only 49.1 percent.
- Children and adolescents (age 1-17) – The first quartile for verification rates was 54.1 percent and the median was 73.3 percent. A separate analysis examined whether verification rates were better for certain ranges of children, such as adolescents or teens. There was no specific range of pediatric ages between 1 and 17 that were markedly better in terms of the percentage verified person numbers.
- Expected payer of Medicaid and No Charge – The first quartile for both was less than 80 percent and the median was about 86 percent.

Revisit/readmission analyses for pediatric conditions and certain payers may only be appropriate in selected States.

SELECTING STATES FOR A REVISIT/READMISSION ANALYSIS

When selecting which States to use for a revisit analysis, please reference the following resources:

- Appendix A provides the list of all States, years, and databases with HCUP revisit variables.
- Appendix C lists States that have inconsistent coding across data years of the source synthetic patient linkage numbers in the respective State database provided by the HCUP Partners and should not be used for analyses that span certain years.

- Appendix D provides information on the consistency of **visitLink** in the SID and the SASD and SEDD within a data year.
- Appendix E provides verification rates by State and year that should be used to determine which HCUP States are best for specific types of revisit or readmission analysis.

USING THE HCUP REVISIT VARIABLES

Using the HCUP revisit variables involves four basic steps

1. For a given State and year, merge the HCUP Revisit File with the corresponding SID, SASD, or SEDD by the data element **KEY** to add the revisit data elements **visitLink** and **DaysToEvent**. This step is only needed for data years 2003-2008. Beginning in data year 2009, the data elements **visitLink** and **DaysToEvent** are included on the Core file of the SID, SASD, and SEDD, when possible.
2. Select patients of interest.
3. Use **visitLink** to identify all events for a patient. The same unique value of **visitLink** is coded on all records for an individual patient. Records with missing values for the **visitLink** variable will be a mixture of patients with unknown revisit information. It may be appropriate to exclude these records from the analysis.
4. Use **DaysToEvent** to sequentially order the visits for a patient and to calculate the time between two visits for a patient. If the **DaysToEvent** is 5 on one event and 35 on another, the time between the *start* of each event is 30 (35-5) because **DaysToEvent** is based on the admission date. If you want to consider the time between the end of the first event and the start of the second event, the length of stay for the first event needs to be subtracted. If the length of stay on the first event is two, then the number of days between is 28 (35-5-2 = 28)

Usage Examples

Use of the HCUP revisit variables is relatively straightforward. Below are three examples of applying these variables to research topics.

Usage Example #1: Assigning Patient Characteristics

Researchers may want to group patients by specific patient characteristics, such as a patient's age or insurance status. When a patient's healthcare experience includes more than one hospital event, categorizing the patient may be problematic. This difficulty arises because some patient characteristics may change over time. To assign attributes based on when a person began receiving services, consider the following steps:

- Data should first be grouped by patient, in service date order (specifically, the HCUP state-level data file, merged with the HCUP Revisit File if prior to 2009, and then sorted by **visitLink** and **DaysToEvent**).
- All records for a patient are then sequentially examined in order to select the first valid, non-missing value for each patient characteristic (age, sex, race, income quartile, location, expected payer).

- The selected attribute(s) are then applied to all events for the patient.

A SAS coding example of how attributes can be assigned is shown in Appendix F.

Usage Example #2: Revisits for Selected Patients

This example counts the number of related events for selected patients with a specific diagnosis and calculates a number of statistics, including days between the initial event and the first subsequent event, by setting. This example focuses on revisits for diabetes but can easily be adapted to any diagnoses.

The example looks for a "clean period," measured in months, with no hospital events for an individual patient for the specified condition. Use of a "clean period" for counting readmissions is optional. Sometimes when identifying an episode of care, rather than straight utilization, a period of time during which the patient has not been admitted or treated is required. The first event after the "clean period" is considered the index event. Any event in a predetermined period of time after the index event becomes part of the "episode."

For illustrative purposes, we selected "diabetes mellitus with complications" (HCUP Clinical Classifications Software (CCS) for ICD-9-CM diagnosis category 50) as the condition and required a clean period of 6 months. The steps are:

1. Combine the event and revisit data
    a. Limit data to linkable patients (a non-missing **visitLink** available)
    b. Select all events with the specified condition (diabetes)
2. Sort the combined events into patient (**visitLink**) and service sequence (**DaysToEvent**) order
3. Find individuals with two or more events
    a. Find patients with a clean period before their first diabetes event
        i. On the first event for a patient, the service must be after clean period, defined as the first six months of the data year
        ii. If the first event was prior to the clean period month, look for a clean period on subsequent events by testing the number of days between the current event and the preceding event
    b. When a clean period is identified
        i. Count the number of events after the clean period
        ii. Determine the settings of the first and second events, and calculate the number of days between the first and second event
    c. Summarize the processing counts
4. Calculate statistics (distribution) for the number of patient events
5. Summarize revisits by the initial and second service settings.

SAS programming code for this example is found in Appendix F.

Usage Example #3: Preceding Visits to any Hospital Setting for Selected Patients

This example identifies patients' hospital events that precede CABG surgery (CCS for ICD-9-CM procedure category 44), regardless of service setting, and summarizes counts by principal diagnosis. The steps are:

1. Combine the event and revisit data
    a. Limit data to linkable patients (a non-missing **visitLink** available)
    b. Identify events with the specified procedure (CABG)
2. Sort the combined events into patient (**visitLink**) and service sequence (**DaysToEvent**) order
3. For patients who received CABG surgery, select all events prior to the surgery
4. Summarize prior events by principal diagnosis and setting.

SAS programming code for this example is found in Appendix E.

Cautionary Note: Transfers and Possible Duplicates

The HCUP revisit variables allow an analyst to identify which records in the SID, SASD, and SEDD belong to the same person, as well as the time between events for that person. An analyst still must decide how to handle the following two types of scenarios:

- Transfers – when a patient is transferred from one acute care hospital to another
- Duplicates – when a record for the same event occurs twice in the HCUP file.

In the SID, there will be two different records if a patient is transferred from one hospital to another. The following can be used to identify the two SID records:

- Same person (**visitLink** is the same on two records)
- Disposition indicating transferred out (**DISPuniform** = 2)
- Admission source indicating transfer in (**ASOURCE** = 2)
- Discharge date of one record is the same as the admission date of another (**DaysToEvent** plus the length of stay of the first record equals the **DaysToEvent** of the second record)
- Different hospital (**DSHOSPID** is different).

Analysts conducting patient-level analyses need to decide how best to use the above information to identify transfers. The coding of admission source and discharge disposition is not always consistent with the timing of events identified by **DaysToEvent** (i.e., **DaysToEvent** may identify two records as two parts of a transfer, but either the disposition or admission source is not coded as such). Table 2 demonstrates the range in the percentage of discharges identified as transfers using different schemes.

Table 2. Range of Percentage of Inpatient Discharges Identified as Transfers

Scheme to identify transfers	Minimum Value Across 15 States	Maximum Value Across 15 States
Percentage of records identified as transfers using one source of information:		
Dates	1.80%	6.41%
Discharged as a transfer to another acute care hospital (DISPuniform=2)	1.36%	3.11%
Admitted as a transfer from an acute care hospital (ASOURCE=2)	0.85%	5.30%
Percentage of records identified as transfers using two sources of information:		
Dates and DISPuniform=2	0.70%	2.07%
Percentage of records identified as transfers using all three sources of information:		
Dates, DISPuniform=2, ASOURCE=2	0.22%	1.50%

Source: HCUP State Inpatient Databases, 15 States, 2006
Note: The Uniform Billing UB-04 Specifications changed coding specifications for Source of Admission to Point of Origin for Admission or Visit starting October 1, 2007.

For some analyses it may be best to combine the two records from a transfer into one by summing the lengths of stay and total charges and combined diagnoses and procedures.

The HCUP SID, SASD, and SEDD occasionally have multiple records for the same person (**visitLink**) with the same **DaysToEvent** and length of stay (**LOS**). These duplicate records may or may not have the similar charge and diagnostic information. Analysts should decide how best to handle such records.

In addition, HCUP made an explicit decision to duplicate records across the SEDD and SASD when a record indicated that the patient received services in both settings. These duplicate records will have the same value for the data element KEY. In this case, the analyst will need to decide how to include and account for these cases. The effect of these duplicated records varies by state from less than 1% in California SASD to about 15% in Tennessee SASD.

Additional considerations for using the HCUP revisit variables for analysis can be found in the HCUP Method Series Report #2011-01, *Methodological Issues When Studying Readmission and Revisits Using Hospital Administrative Data.*

APPENDIX A: AVAILABLE HCUP SUPPLEMENTAL VARIABLES FOR REVISIT ANALYSES

HCUP revisit variables are available for the following States, years, and databases. For data years 2003-2008, the supplemental Revisit Files must be linked using the KEY data element to corresponding HCUP SID, SASD, or SEDD for any analysis. Starting with 2009 data, the revisit variables are included in the Core file, when available.

Information on some HCUP State databases are to be determined (TBD) after HCUP data processing.

Table A-1. HCUP Revisit Variables by State and Data Type, 2013-2021

State and Data Type	Data Year								
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Alaska									
SID	--	--	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	--	--	--	--	--	--	Yes	Yes	TBD
SASD	--	--	--	--	--	--	Yes	Yes	TBD
Arkansas									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
California									
SID	--	--	--	--	--	Yes	Yes	Yes	Yes
SEDD	--	--	--	--	--	Yes	Yes	Yes	Yes
SASD	--	--	--	--	--	Yes	Yes	Yes	Yes
Colorado									
SID	--	--	--	--	--	--	Yes	Yes	TBD
SEDD	--	--	--	--	--	--	Yes	Yes	TBD
SASD	--	--	--	--	--	--	Yes	Yes	TBD
Delaware									
SID	--	--	--	Yes	Yes	Yes	Yes	Yes	TBD
Florida									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Georgia									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
Indiana									
SID	--	--	--	--	Yes	Yes	Yes	Yes	TBD
SEDD	--	--	--	--	Yes	Yes	Yes	Yes	TBD
SASD	--	--	--	--	Yes	Yes	Yes	Yes	TBD
Iowa									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maine									
SID	--	--	--	--	--	--	--	Yes	TBD

State and Data Type	Data Year								
	2013	2014	2015	2016	2017	2018	2019	2020	2021
Maryland									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Massachusetts									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
Mississippi									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Missouri									
SID	--	--	--	--	Yes	Yes	Yes	Yes	TBD
SEDD	--	--	--	--	Yes	Yes	Yes	Yes	TBD
SASD	--	--	--	--	Yes	Yes	Yes	Yes	TBD
Nebraska									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
New Mexico									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
New York									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
Utah									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
Vermont									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
Washington									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	TBD
Wisconsin									
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table A-2. HCUP Revisit Variables by State and Data Type, 2003-2012

State and Data Type	Data Year									
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Alaska										
SID	--	--	--	--	--	--	--	--	--	--
Arizona										
SID	Yes	Yes	Yes	Yes	Yes[a]					
SEDD	--	--	Yes	Yes	Yes[a]					
Arkansas										
SID	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	--	--	--	--	--	--	--	--	--	--
California										
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	--
SEDD	--	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes	--
SASD	--	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes	--
Colorado										
SID	--	--	--	--	--	--	--	--	--	--
SEDD	--	--	--	--	--	--	--	--	--	--
SASD	--	--	--	--	--	--	--	--	--	--
Delaware										
SID	--	--	--	--	--	--	--	--	--	--
Florida										
SID	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	--	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Georgia										
SID	--	--	--	--	--	--	--	Yes	Yes	Yes
SEDD	--	--	--	--	--	--	--	Yes	Yes	Yes
SASD	--	--	--	--	--	--	--	Yes	Yes	Yes
Indiana										
SID	--	--	--	--	--	--	--	--	--	--
SEDD	--	--	--	--	--	--	--	--	--	--
SASD	--	--	--	--	--	--	--	--	--	--
Iowa										
SID	--	--	--	--	--	--	Yes	Yes	Yes	Yes
SEDD	--	--	--	--	--	--	--	Yes	Yes	Yes
SASD	--	--	--	--	--	--	--	Yes	Yes	Yes
Maryland										
SID	--	--	--	--	--	--	--	--	--	Yes
SEDD	--	--	--	--	--	--	--	--	--	--
SASD	--	--	--	--	--	--	--	--	--	--
Massachusetts										
SID	--	--	--	--	--	--	--	Yes	Yes	Yes
SEDD	--	--	--	--	--	--	--	Yes	Yes	Yes

State and Data Type	Data Year									
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Mississippi										
SID	--	--	--	--	--	--	--	Yes	Yes	--
Missouri										
SID	--	--	--	--	--	--	--	--	--	--
SEDD	--	--	--	--	--	--	--	--	--	--
SASD	--	--	--	--	--	--	--	--	--	--
Nebraska										
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nevada										
SID	Yes	Yes	Yes	Yes	Yes[a]					
New Mexico										
SID	--	--	--	--	--	--	Yes	Yes	Yes	Yes
New York										
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	--	--	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
North Carolina										
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes[a]		
SEDD	--	--	--	--	Yes	Yes	Yes	Yes[a]		
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes[a]		
Utah										
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SEDD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SASD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vermont										
SID	--	--	--	--	--	--	--	--	Yes	Yes
SEDD	--	--	--	--	--	--	--	--	Yes	Yes
SASD	--	--	--	--	--	--	--	--	Yes	Yes
Washington										
SID	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wisconsin										
SID	--	--	--	--	--	--	--	--	--	--
SEDD	--	--	--	--	--	--	--	--	--	--
SASD	--	--	--	--	--	--	--	--	--	--

[a] HCUP Revisit Variables are unavailable after this data year for this State.

APPENDIX B: EXAMPLE OF ASSIGNMENT OF VISITLINK AND DAYSTOEVENT

The following table lists examples of the assignment of **visitLink** and **DaysToEvent** in different scenarios.

No.	Partner-Provided Synthetic Patient Linkage Number	Date of Birth	Sex	Example of visitLink	Randomly Assigned Base Date for visitLink	Admission Date	DaysToEvent	Notes on visitLink Assignment
1	A	15-Jan-60	M	11111	1/1/1980	1/5/2013	12058	Same patient ID, date of birth, and sex for observations 1 and 2, therefore same VisitLink
2	A	15-Jan-60	M	11111	1/1/1980	3/5/2013	12117	Same patient ID, date of birth, and sex for observations 1 and 2, therefore same VisitLink
3	A	15-Jan-60	F	11112	6/15/1953	11/17/2013	22070	Same patient ID and date of birth as observations 1 and 2, but different sex, therefore different VisitLink
4	B	1-May-40	F	11113	11/11/2011	3/3/2013	478	Same patient ID, date of birth, sex for observations 4 through 6, therefore same VisitLink
5	B	1-May-40	F	11113	11/11/2011	5/5/2013	541	Same patient ID, date of birth, sex for observations 4 through 6, therefore same VisitLink
6	B	1-May-40	F	11113	11/11/2011	11/12/2013	732	Same patient ID, date of birth, sex for observations 4 through 6, therefore same VisitLink
7	B	15-Jun-45	F	11114	5/23/2000	6/1/2013	4757	Same patient ID and sex as observations 4 through 6, but different date of birth, therefore different VisitLink
8	B	15-Jun-45	F	11114	5/23/2000	6/23/2013	4779	Same patient ID and sex as observations 4 through 6, but different date of birth, therefore different VisitLink
9	B	15-Jun-45	F	11114	5/23/2000	7/30/2013	4816	Same patient ID and sex as observations 4 through 6, but different date of birth, therefore different VisitLink
10	C	1-Dec-80	M	11115	12/1/1940	2/3/2013	26362	Same patient ID, date of birth, sex for observations 10 and 11, therefore same VisitLink
11	C	1-Dec-80	M	11115	12/1/1940	6/15/2013	26494	Same patient ID, date of birth, sex for observations 10 and 11, therefore same VisitLink
12	C	Not Available	M	Missing	Not assigned because no VisitLink	8/4/2013	Not assigned because no VisitLink	Same patient ID and sex as observations 10 and 11, but missing date of birth, therefore VisitLink is missing

APPENDIX C: CONSISTENCY OF SYNTHETIC PATIENT LINKAGE NUMBERS ACROSS CONSECUTIVE YEARS

The HCUP data element **visitLink** is derived from synthetic patient linkage numbers provided by the HCUP Partner. Partners sometimes change their coding scheme between data years, which in turn causes a discontinuity in **visitLink**. The table below lists the percentage of unique values of **visitLink** that appear in consecutive data years of the SID, SEDD, or SASD. If the percentage is low or different than other pairs of years, it is a good indication that the **visitLink** cannot be used to track patients across those data years. A dash indicates that **visitLink** is not available in one or both years.

To better understand how to interpret the table below, consider the following example. In Washington, 16 percent of the **visitLink** values in 2003 also appeared in 2004. This is a good indication that **visitLink** can be used to track WA patients between 2003 and 2004. The percentage of overlap in **visitLink** is 17 percent in 2004-2005 and 2005-2006 for WA. This is a good indication that **visitLink** can be used to track WA patients from 2003 through 2006. In contrast, between the next two data years, 2006 and 2007, the percentage of overlap in **visitLink** is zero for WA. This indicates that **visitLink** should *not* be used to track WA patients from 2006 into 2007, from 2007 into 2008, etc. In addition, the percentage of overlap is 100 percent between 2011 and 2012 for WA. The exact same values of visitLink were used for different people in these two data years; do not use the two years of WA SID (2011 and 2012) together.

Information on some HCUP databases are to be determined (TBD) after HCUP data processing.

Table C-1. Percentage of visitLink Values Reported in Consecutive Data Years, State Inpatient Databases 2012-2021

State	Data Years of the State Inpatient Databases (SID)								
	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
AK	--	--	--	19%	20%	20%	20%	21%	TBD
AR	24%	23%	23%	24%	24%	24%	24%	23%	TBD
CA	--	--	--	--	--	--	22%	22%	20%
CO	--	--	--	--	--	--	--	16%	TBD
DE	--	--	--	--	100%	0%	0%	0%	TBD
FL	26%	25%	26%	26%	26%	26%	26%	26%	23%
GA	0%	19%	19%	19%	19%	19%	20%	0%	TBD
IA	0%	17%	17%	18%	0%	19%	19%	18%	17%
IN	--	--	--	--	--	22%	23%	23%	TBD
MA	26%	26%	25%	26%	26%	26%	27%	0%	TBD
MD	0%	20%	20%	20%	19%	15%	19%	19%	17%
ME	--	--	--	--	--	--	--	--	TBD
MO	--	--	--	--	--	24%	24%	25%	TBD
MS	--	20%	21%	21%	13%	14%	21%	21%	19%
NE	17%	17%	17%	17%	18%	18%	18%	0%	TBD
NM	0%	0%	0%	17%	0%	0%	0%	18%	TBD
NY	20%	20%	19%	19%	18%	17%	19%	18%	TBD
UT	15%	14%	0%	15%	17%	18%	18%	17%	TBD
VT	19%	19%	19%	19%	19%	19%	18%	21%	TBD
WA	0%	0%	0%	0%	0%	0%	0%	0%	TBD
WI	--	20%	20%	20%	20%	17%	18%	19%	18%

Table C-2. Percentage of visitLink Values Reported in Consecutive Data Years, State Inpatient Databases 2003-2012

State	Data Years of the State Inpatient Databases (SID)								
	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
AK	--	--	--	--	--	--	--	--	--
AR	--	22%	22%	22%	22%	23%	23%	23%	23%
AZ	12%	12%	11%	13%[a]					
CA	22%	22%	22%	22%	22%	22%	22%	23%	--
CO	--	--	--	--	--	--	--	--	--
DE	--	--	--	--	--	--	--	--	--
FL	--	0%	24%	24%	24%	25%	25%	26%	25%
GA	--	--	--	--	--	--	--	20%	0%
IA	--	--	--	--	--	--	20%	20%	20%
IN	--	--	--	--	--	--	--	--	--
MA	--	--	--	--	--	--	--	26%	26%
MD	--	--	--	--	--	--	--	--	--
ME	--	--	--	--	--	--	--	--	--
MO	--	--	--	--	--	--	--	--	--
MS	--	--	--	--	--	--	--	25%	--
NC	20%	21%	20%	21%	21%	21%	22%[a]		
NE	18%	16%	17%	18%	18%	18%	18%	18%	18%
NM	--	--	--	--	--	--	4%	2%	0%
NV	16%	16%	17%	18%[a]					
NY	0%	0%	20%	21%	20%	20%	20%	20%	20%
UT	14%	14%	14%	14%	14%	14%	14%	14%	14%
VT	--	--	--	--	--	--	--	--	18%
WA	16%	17%	17%	0%	0%	0%	0%	0%	100%
WI	--	--	--	--	--	--	--	--	--

[a] HCUP Revisit Variables are unavailable after this data year for this State.

Table C-3 Percentage of visitLink Values Reported in Consecutive Data Years, State Emergency Department Databases 2012-2021

State	Data Years of the State Emergency Department Databases (SEDD)								
	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
AK	--	--	--	--	--	--	--	44%	TBD
AR	--	39%	40%	40%	40%	40%	39%	38%	TBD
CA	--	--	--	--	--	--	36%	37%	32%
CO	--	--	--	--	--	--	--	33%	TBD
FL	38%	38%	39%	39%	40%	40%	40%	41%	34%
GA	0%	39%	39%	39%	39%	40%	40%	0%	TBD
IA	0%	35%	36%	36%	0%	37%	37%	38%	32%
IN	--	--	--	--	--	40%	40%	41%	TBD
MA	38%	38%	38%	39%	38%	38%	39%	39%	TBD
MD	--	37%	38%	38%	35%	29%	36%	38%	30%
MO	--	--	--	--	--	42%	41%	42%	TBD
NE	29%	30%	30%	30%	31%	31%	31%	0%	TBD
NY	33%	33%	33%	33%	32%	29%	31%	30%	TBD
UT	31%	30%	0%	31%	31%	31%	31%	31%	TBD
VT	38%	37%	37%	38%	37%	37%	37%	39%	TBD
WI	--	35%	36%	36%	37%	30%	33%	37%	32%

Table C-4. Percentage of visitLink Values Reported in Consecutive Data Years, State Emergency Department Databases 2003-2012

State	Data Years of the State Emergency Department Databases (SEDD)								
	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
AK	--	--	--	--	--	--	--	--	--
AR	--	--	--	--	--	--	--	--	--
AZ	--	--	19%	20%[a]	--	--	--	--	--
CA	--	--	29%	29%	30%	30%	32%	32%	--
CO									37%
FL	--	--	32%	33%	33%	34%	36%	36%	0%
GA	--	--	--	--	--	--	--	38%	33%
IA	--	--	--	--	--	--	--	34%	--
IN	--	--	--	--	--	--	--	--	38%
MA	--	--	--	--	--	--	--	37%	--
MD	--	--	--	--	--	--	--	--	--
MO	--	--	--	--	--	--	--	--	29%
NE	26%	24%	25%	27%	27%	27%	29%	29%	32%
NY	--	--	--	29%	29%	30%	31%	31%	30%
UT	--	--	--	--	34%	34%	38%[a]	--	33%
VT	28%	28%	29%	29%	30%	30%	31%	30%	--
WI	--	--	--	--	--	--	--	--	--

[a] HCUP Revisit Variables are unavailable after this data year for this State.

Table C-5 Percentage of visitLink Values Reported in Consecutive Data Years, State Ambulatory Surgery and Services Databases 2012-2021

State	State Ambulatory Surgery and Services Databases (SASD)								
	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021
AK	--	--	--	--	--	--	--	60%	TBD
CA	--	--	--	--	--	--	18%	19%	17%
CO	--	--	--	--	--	--	--	20%	TBD
FL	26%	26%	25%	26%	26%	26%	25%	24%	22%
GA	0%	44%	45%	44%	45%	45%	46%	0%	TBD
IA	0%	24%	25%	25%	0%	26%	26%	28%	24%
IN	--	--	--	--	--	23%	23%	26%	TBD
MD	--	48%	49%	49%	47%	38%	50%	50%	41%
MO	--	--	--	--	--	66%	66%	66%	TBD
NE	18%	18%	18%	19%	20%	20%	20%	0%	TBD
NY	40%	41%	41%	36%	48%	47%	51%	49%	TBD
UT	23%	24%	0%	26%	26%	21%	50%	50%	TBD
VT	74%	73%	73%	74%	72%	74%	72%	74%	TBD
WI	--	28%	28%	29%	29%	26%	26%	28%	24%

Table C-6. Percentage of visitLink Values Reported in Consecutive Data Years, State Ambulatory Surgery and Services Databases 2003-2012

State	State Ambulatory Surgery and Services Databases (SASD)								
	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
AK	--	--	--	--	--	--	--	--	--
CA	--	--	20%	20%	21%	20%	19%	18%	--
CO	--	--	--	--	--	--	--	--	--
FL	--	0%	26%	26%	27%	27%	27%	27%	26%
GA	--	--	--	--	--	--	--	43%	0%
IA	--	--	--	--	--	--	--	19%	--
IN	--	--	--	--	--	--	--	--	--
MD	--	--	--	--	--	--	--	--	--
MO	--	--	--	--	--	--	--	--	--
NE	20%	17%	17%	20%	19%	17%	17%	18%	18%
NY	0%	0%	17%	17%	18%	18%	20%	11%	14%
UT	18%	19%	22%	24%	16%	19%	21%[a]	--%	23%
VT	21%	23%	22%	22%	21%	21%	20%	22%	68%
WI	--	--	--	--	--	--	--	--	--

[a] HCUP Revisit Variables are unavailable after this data year for this State.

APPENDIX D: CONSISTENCY OF SYNTHETIC PATIENT LINKAGE NUMBERS BETWEEN THE SID AND SEDD, AND SASD WITHIN A DATA YEAR

The year-specific tables on the following pages detail the percentage of verified patient linkage numbers (**visitLink**) in the SID that overlap with the SASD and SEDD. The tables allow the analyst to determine the best possible States for a revisit analysis intended to track sequential visits for patients across settings of care. Across States and available data years beginning data year 2016, the average percent overlap between the SID and SEDD is approximately 43 percent whereas between the SID and SASD, the average percent overlap is approximately 33 percent. The average decreases to approximately 17 percent when examining the percent overlap in the SID with both the SASD and SEDD.

To better understand how to interpret the tables below, consider the following example. In Vermont, 46 percent of **visitLink** values in the 2016 SID also appeared in the 2016 SEDD. This is a good indication that **visitLink** can be used to track patients across these settings of care. The percent overlap of **visitLink** values between the 2016 SID and 2016 SASD is 87 percent. Relative to the average, this is a much higher percentage and a possible indication that **visitLink** values may be used for different people between the two settings of care. A percentage overlap of 0 would indicate that **visitLink** values are reassigned with each setting of care and therefore, patients are not able to be tracked.

Some States either do not provide ED or ambulatory surgery and other outpatient services data to HCUP or do not release a SEDD or SASD through the HCUP Central Distributor in given year and are marked accordingly in the tables below (--). Information on some HCUP databases are to be determined (TBD) after HCUP data processing.

Table D-1. Percentage Overlap of visitLink in the SID With the SEDD and SASD, 2021

State	Total SID Record Count	Total SID visitLink Count	visitLink Overlap Between SID and SEDD	visitLink Overlap Between SID and SASD	visitLink Overlap Between SID, SEDD, and SASD
CA	3,557,587	1,848,321	43%	13%	7%
FL	2,836,338	1,523,578	45%	19%	10%
IA	300,168	225,134	46%	22%	13%
MD	532,224	394,193	39%	42%	20%
MS	337,335	242,580	47%	--	--
WI	550,072	408,962	46%	29%	19%

Table D-2. Percentage Overlap of visitLink in the SID With the SEDD and SASD, 2020

State	Total SID Record Count	Total SID visitLink Count	visitLink Overlap Between SID and SEDD	visitLink Overlap Between SID and SASD	visitLink Overlap Between SID, SEDD, and SASD
AK	56,021	32,951	52%	76%	42%
AR	375,156	226,920	42%	--	--
CA	3,444,532	1,801,200	42%	12%	6%
CO	448,304	345,245	40%	14%	8%
DE	101,509	77,337	--	--	--
FL	2,673,442	1,444,770	44%	19%	9%
GA	1,034,904	748,844	41%	25%	13%
IA	301,581	224,980	43%	21%	12%
IN	706,844	419,443	47%	26%	16%
MA	732,345	515,732	0%	--	--
MD	522,191	389,298	37%	39%	18%
ME	124,465	78,051	--	--	--
MO	767,881	445,825	46%	76%	37%
MS	343,727	245,474	--	--	--
NE	188,177	138,706	36%	20%	10%
NM	186,464	140,119	--	--	--
NY	2,052,372	1,448,449	29%	41%	15%
UT	271,747	154,851	38%	44%	20%
VT	48,403	30,024	46%	84%	43%
WA	583,143	447,199	--	--	--
WI	538,684	399,875	43%	26%	17%

Table D-3. Percentage Overlap of visitLink in the SID With the SEDD and SASD, 2019

State	Total SID Record Count	Total SID visitLink Count	visitLink Overlap Between SID and SEDD	visitLink Overlap Between SID and SASD	visitLink Overlap Between SID, SEDD, and SASD
AK	62,084	35,267	55%	75%	44%
AR	411,283	245,423	45%	--	--
CA	3,827,200	1,976,060	45%	14%	7%
CO	473,313	361,530	43%	15%	9%
DE	113,157	84,229	--	--	--
FL	2,893,530	1,555,143	47%	20%	10%
GA	1,111,386	797,975	45%	27%	15%
IA	329,367	243,062	46%	23%	14%
IN	769,052	457,437	49%	29%	18%
MA	808,968	408,256	43%	--	--
MD	582,026	422,735	41%	44%	22%
MO	844,041	485,047	49%	76%	40%
MS	377,094	261,986	--	--	--
NE	204,530	150,955	39%	20%	11%
NM	205,813	151,387	--	--	--
NY	2,312,127	1,592,272	32%	44%	18%
UT	288,664	160,643	40%	47%	22%
VT	57,180	34,914	46%	86%	43%
WA	643,855	484,839	--	--	--
WI	584,456	431,441	45%	29%	18%

Table D-4. Percentage Overlap of visitLink in the SID With the SEDD and SASD, 2018

State	Total SID Record Count	Total SID visitLink Count	visitLink Overlap Between SID and SEDD	visitLink Overlap Between SID and SASD	visitLink Overlap Between SID, SEDD, and SASD
AK	62,398	35,611	--	--	--
AR	401,831	241,258	46%	--	--
CA	3,819,392	1,991,459	45%	14%	7%
DE	112,897	84,166	--	--	--
FL	2,855,604	1,560,730	47%	21%	10%
GA	1,101,923	796,341	44%	26%	15%
IA	330,988	244,625	46%	23%	14%
IN	779,404	492,472	47%	25%	15%
MA	807,126	425,818	43%	--	--
MD	598,751	432,941	41%	44%	22%
MO	847,557	492,162	48%	76%	39%
MS	382,288	267,646	--	--	--
NE	205,706	152,425	38%	20%	10%
NM	201,308	166,688	--	--	--
NY	2,337,668	1,617,951	32%	44%	18%
UT	284,956	161,738	40%	47%	22%
VT	53,560	31,869	45%	87%	42%
WA	643,855	484,839	--	--	--
WI	584,533	442,438	40%	25%	16%

Table D-5. Percentage Overlap of visitLink in the SID With the SEDD and SASD, 2017

State	Total SID Record Count	Total SID visitLink Count	visitLink Overlap Between SID and SEDD	visitLink Overlap Between SID and SASD	visitLink Overlap Between SID, SEDD, and SASD
AK	64,023	36,631	--	--	--
AR	401,032	243,718	46%	--	--
DE	112,422	84,156	--	--	--
FL	2,847,000	1,570,289	46%	21%	11%
GA	1,089,399	792,399	44%	26%	14%
IA	340,611	249,543	46%	23%	14%
IN	777,401	543,686	44%	23%	14%
MA	811,627	434,023	43%	--	--
MD	613,079	441,604	41%	45%	23%
MO	845,147	493,297	49%	76%	40%
MS	389,006	298,158	--	--	--
NE	207,638	154,787	37%	20%	10%
NM	201,474	167,353	--	--	--
NY	2,362,414	1,694,194	32%	47%	19%
UT	291,934	178,598	36%	27%	12%
VT	53,630	33,465	46%	88%	43%
WA	654,444	493,229	--	--	--
WI	602,090	440,195	45%	31%	19%

Table D-6. Percentage Overlap of visitLink in the SID With the SEDD and SASD, 2016

State	Total SID Record Count	Total SID visitLink Count	visitLink Overlap Between SID and SEDD	visitLink Overlap Between SID and SASD	visitLink Overlap Between SID, SEDD, and SASD
AK	63,551	36,297	--	--	--
AR	399,327	243,385	45%	--	--
DE	112,117	84,838	--	--	--
FL	2,837,863	1,574,436	46%	21%	11%
GA	1,070,471	784,175	43%	25%	14%
IA	312,732	233,401	43%	24%	14%
MA	803,070	429,743	43%	--	--
MD	622,815	448,754	41%	46%	23%
MS	378,494	266,417	--	--	--
NE	202,658	152,610	36%	20%	10%
NM	200,458	149,799	--	--	--
NY	2,347,084	1,659,237	35%	50%	22%
UT	296,903	191,743	33%	23%	11%
VT	53,652	33,096	46%	87%	41%
WA	649,624	492,660	--	--	--
WI	602,279	441,720	44%	30%	18%

APPENDIX E: CONSISTENCY OF VERIFIED REVISIT INFORMATION

The consistency of the verified patient linkage numbers is evaluated when the HCUP revisit variables are created for a State. The year-specific tables on the following pages detail the number of total records in the SID, SEDD, or SASD and the percentage of records with a verified patient linkage number (**visitLink**).

The tables allow the analyst to determine the best possible States for a revisit analysis. Researchers should use the HCUP revisit variables with caution when looking at revisits for specific patient populations that have a low percentage of verified patient linkage numbers. If studying pediatric conditions, consider States with a high percentage of verified patient linkage numbers for ages under 18. If a proposed study is specific to other patient or hospital characteristics, generate statistics on the percent verified by the study focus and select States with a high percentage of verified patient linkage numbers.

State Inpatient Databases, 2021

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	448,310	10.5	141,950	32.4	1,787,193	82.5	1,180,021	90.9
FL	230,056	1.5	92,758	38.7	1,351,787	87.6	1,161,625	93.4
IA	39,370	100.0	10,908	100.0	134,965	100.0	114,925	100.0
MD	65,776	99.9	10,463	99.9	263,648	99.9	192,320	100.0
MS	36,210	99.9	12,154	100.0	163,490	100.0	125,481	100.0
WI	63,939	100.0	22,421	100.0	256,530	100.0	207,178	100.0

State Emergency Department Databases, 2021

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	211,429	19.8	1,658,053	35.5	7,140,792	82.4	1,917,698	91.9
FL	180,119	16.7	1,490,468	37.3	5,459,011	87.8	1,478,627	93.1
IA	27,843	100.0	168,616	100.0	632,196	99.3	233,362	99.8
MD	32,706	100.0	225,772	99.9	1,135,838	98.1	303,594	99.3
WI	41,787	100.0	264,933	100.0	1,164,599	98.9	419,768	99.8

State Ambulatory Services and Surgery Databases, 2021

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	6,419	20.2	142,753	34.8	1,209,151	83.6	808,376	91.0
FL	8,201	24.2	115,799	40.0	1,596,804	79.7	1,549,609	83.1
IA	3,518	100.0	29,964	100.0	270,180	99.4	196,344	99.7
MD	26,471	99.5	211,888	94.1	1,703,982	95.3	1,055,424	96.9
WI	4,440	100.0	47,504	100.0	629,539	99.9	465,350	99.9

State Inpatient Databases, 2020

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	8,416	3.9	2,451	50.5	29,876	94.5	15,276	97.3
AR	36,366	25.1	18,336	75.0	183,008	95.7	137,432	98.5
CA	448,198	10.6	130,531	34.7	1,736,565	83.4	1,129,131	92.0
CO	55,732	99.8	16,546	99.9	225,145	99.8	150,868	99.7
DE	12,311	100.0	4,636	100.0	44,930	100.0	39,631	100.0
FL	221,909	1.5	79,223	42.5	1,275,601	89.1	1,096,581	94.4
GA	124,384	99.9	34,191	99.8	529,361	97.8	346,813	99.2
IA	37,963	100.0	10,059	100.0	136,517	100.0	117,042	100.0
IN	80,721	5.8	16,735	68.6	336,469	93.6	272,843	96.4
MA	73,490	100.0	17,103	100.0	341,761	100.0	299,983	100.0
MD	67,101	99.9	9,711	99.9	261,627	99.9	183,747	100.0
ME	11,986	40.0	3,382	81.4	56,045	97.6	53,038	90.6
MO	77,949	14.0	38,012	50.8	372,325	94.0	279,586	97.9
MS	36,177	99.9	11,500	100.0	167,666	100.0	128,384	100.0
NE	25,071	100.0	7,711	100.0	84,606	100.0	70,785	100.0
NM	21,706	99.9	8,307	100.0	95,683	100.0	60,765	100.0
NY	218,568	94.7	59,903	92.7	1,025,177	92.1	748,701	95.5
UT	49,004	13.2	14,959	48.8	140,274	88.9	67,496	93.9
VT	5,152	9.9	1,352	59.5	21,820	92.6	20,079	95.8
WA	81,871	100.0	16,188	100.0	278,973	100.0	206,110	100.0
WI	62,557	100.0	19,630	100.0	249,894	100.0	206,599	100.0

State Emergency Department Databases, 2020

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	5,118	24.7	33,888	51.5	169,119	94.3	36,910	97.2
AR	22,910	26.4	164,096	54.1	655,305	95.6	167,093	98.6
CA	187,304	21.5	1,408,464	37.4	6,727,168	83.1	1,719,059	92.7
CO	32,506	100.0	239,982	99.5	1,027,716	97.3	264,330	99.1
FL	127,587	17.4	1,053,817	41.5	4,782,338	89.2	1,276,536	93.9
GA	69,288	100.0	500,476	99.9	2,381,559	97.3	498,124	99.0
IA	20,419	100.0	134,959	100.0	580,818	99.2	204,114	99.6
IN	43,558	20.5	320,157	70.4	1,523,220	94.7	400,582	98.0
MA	27,136	7.3	230,303	32.0	1,262,526	81.7	318,258	93.0
MD	25,483	100.0	178,996	99.9	1,058,179	97.8	262,760	99.2
MO	52,260	26.5	413,253	48.5	1,485,413	94.3	380,372	98.3
NE	12,553	100.0	77,065	100.0	261,842	98.9	97,943	99.9
NY	85,206	82.2	647,602	80.1	3,651,261	82.2	813,041	90.7
UT	12,846	17.1	103,373	36.1	440,309	88.1	104,774	95.3
VT	2,077	17.4	22,897	47.8	120,652	88.9	45,318	94.5
WI	33,029	100.0	209,468	99.9	1,044,625	99.1	361,285	99.8

State Ambulatory Services and Surgery Databases, 2020

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	18,633	19.6	128,238	57.6	762,910	89.8	290,204	89.7
CA	5,885	20.6	125,887	36.1	1,062,840	85.4	690,774	92.4
CO	2,189	100.0	26,288	99.7	222,083	99.1	134,834	99.4
FL	7,485	24.3	100,861	41.0	1,383,315	81.2	1,325,981	84.3
GA	6,513	100.0	64,779	100.0	1,249,573	99.5	711,675	99.5
IA	3,112	100.0	26,774	100.0	235,479	99.4	164,296	99.6
IN	4,903	17.5	63,591	66.3	555,770	95.5	325,692	97.6
MD	23,807	99.7	179,780	93.5	1,480,108	94.6	853,949	96.3
MO	163,376	26.2	1,083,113	49.3	6,138,967	92.5	3,778,083	94.0
NE	2,402	100.0	18,859	100.0	108,574	99.9	87,413	99.9
NY	242,144	65.8	1,428,249	59.0	12,793,837	68.1	6,312,732	76.9
UT	23,839	23.5	132,995	44.9	1,046,980	79.2	531,944	85.5
VT	5,180	22.4	74,584	52.3	744,473	89.2	630,307	92.9
WI	3,898	100.0	42,168	100.0	531,062	99.9	378,311	100.0

State Inpatient Databases, 2019

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	9,189	4.9	3,419	50.3	32,266	95.6	17,208	97.1
AR	40,822	32.4	22,048	75.0	195,566	96.4	152,839	98.9
CA	486,643	11.9	167,617	35.0	1,891,273	84.1	1,281,552	93.1
CO	54,392	99.8	21,381	100.0	233,850	99.9	163,658	100.0
DE	13,057	100.0	6,307	100.0	48,438	100.0	45,355	100.0
FL	239,073	2.2	97,179	42.5	1,361,810	90.1	1,195,409	95.2
IA	40,781	100.0	12,260	100.0	146,593	100.0	129,733	100.0
IN	84,784	8.3	20,344	72.8	361,067	94.4	302,835	97.0
GA	132,399	99.9	39,619	100.0	558,022	99.9	381,189	100.0
MA	77,605	1.4	23,029	28.0	372,963	83.1	335,366	90.1
MD	69,457	100.0	12,851	99.9	288,254	100.0	211,446	100.0
MO	83,867	15.8	45,211	51.0	405,619	94.7	309,339	98.2
MS	38,255	100.0	14,658	100.0	180,601	99.9	143,580	100.0
NE	25,735	100.0	8,474	100.0	91,928	100.0	78,389	100.0
NM	23,596	99.2	11,319	99.9	102,339	100.0	68,553	100.0
NY	230,080	93.3	83,942	91.8	1,135,398	92.3	862,670	96.0
UT	51,494	5.4	18,227	46.5	144,953	89.9	73,966	94.9
VT	5,531	12.4	1,773	55.7	26,116	91.0	23,759	96.1
WA	85,350	100.0	18,884	100.0	299,954	100.0	236,492	100.0
WI	66,301	100.0	23,419	100.0	270,632	100.0	224,099	100.0

State Emergency Department Databases, 2019

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	9,107	28.1	56,084	51.0	209,742	94.9	45,045	96.8
AR	37,158	30.2	231,760	55.4	734,687	96.3	192,316	98.9
CA	329,692	23.1	2,459,098	36.8	7,938,249	83.2	2,141,128	92.8
CO	54,556	100.0	371,518	100.0	1,151,490	99.2	305,557	99.7
FL	228,270	20.7	1,771,432	42.5	5,691,208	90.4	1,560,379	94.5
GA	132,368	100.0	841,111	100.0	2,825,221	98.2	609,439	99.2
IA	34,645	100.0	195,249	100.0	664,273	99.3	234,557	99.8
IN	74,236	27.8	479,918	76.5	1,760,042	95.3	466,709	98.2
MA	48,681	16.8	392,177	38.4	1,569,910	83.0	395,182	92.7
MD	47,948	100.0	316,801	100.0	1,334,277	97.8	340,305	99.4
MO	82,162	30.1	575,329	49.1	1,735,102	95.4	472,036	98.5
NE	20,406	99.9	106,973	99.9	283,970	98.9	103,657	99.9
NY	152,507	78.8	1,108,788	76.1	4,421,304	81.5	1,047,876	89.6
UT	18,454	8.1	137,119	35.3	476,563	88.6	117,047	95.3
VT	3,444	22.0	35,588	50.2	146,636	89.6	53,633	94.7
WI	52,323	100.0	308,386	100.0	1,188,377	99.0	401,099	99.8

State Ambulatory Services and Surgery Databases, 2019

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	24,038	23.7	144,644	57.9	699,212	90.1	307,010	88.0
CA	7,008	21.7	164,966	38.3	1,241,624	86.1	817,525	93.2
CO	2,327	100.0	30,947	100.0	236,909	99.9	144,105	99.9
FL	9,157	17.8	128,161	33.8	1,546,882	76.4	1,524,037	79.8
GA	8,686	100.0	82,790	100.0	1,403,129	99.7	789,705	99.7
IA	4,252	100.0	34,264	99.8	277,089	99.5	192,847	99.6
IN	6,954	24.9	82,655	72.7	641,385	96.2	378,340	98.0
MD	29,582	100.0	229,046	93.5	1,839,360	93.3	1,108,091	95.6
MO	198,749	25.4	1,293,407	48.0	5,979,989	93.1	3,897,527	94.2
NE	2,989	100.0	22,141	100.0	106,975	99.7	73,265	99.8
NY	255,333	67.3	1,607,894	62.2	12,769,762	70.6	6,935,468	77.8
UT	25,799	29.6	146,575	48.0	1,088,692	83.8	617,999	87.7
VT	5,438	26.9	75,961	58.2	828,070	91.4	728,257	92.7
WI	5,233	100.0	57,090	100.0	641,629	99.9	443,087	99.9

State Inpatient Databases, 2018

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	9,605	3.9	3,632	53.1	32,489	96.2	16,668	98.6
AR	40,407	34.2	21,181	74.6	191,327	96.8	148,886	99.4
CA	495,430	10.7	166,365	37.2	1,901,633	84.7	1,255,837	94.9
DE	13,283	100.0	7,285	100.0	48,995	100.0	43,333	100.0
FL	241,739	2.6	102,310	45.7	1,353,290	91.3	1,158,193	96.8
GA	132,085	99.9	40,322	100.0	557,997	99.9	371,341	100.0
IA	40,476	100.0	12,806	100.0	148,863	100.0	128,843	100.0
IN	85,927	32.8	24,764	82.9	369,600	96.3	299,079	98.1
MA	77,809	2.1	23,690	30.0	376,165	86.5	329,450	93.8
MD	70,631	100.0	13,334	99.9	299,943	99.9	214,828	100.0
MO	84,346	16.4	46,213	51.5	411,150	95.1	305,842	98.7
MS	38,789	99.9	15,630	100.0	185,994	99.9	141,874	100.0
NE	26,306	100.0	8,793	100.0	93,446	100.0	77,157	100.0
NM	23,617	99.7	10,774	100.0	100,282	100.0	66,631	100.0
NY	231,540	93.7	89,718	92.6	1,160,539	93.1	855,840	96.7
UT	51,653	6.0	17,734	49.4	143,901	91.3	71,626	96.7
VT	5,663	12.3	1,068	67.0	23,444	87.0	23,385	89.5
WA	85,750	100.0	19,739	100.0	304,107	100.0	234,259	100.0
WI	66,270	100.0	24,087	100.0	272,617	100.0	221,552	100.0

State Emergency Department Databases, 2018

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	36,026	30.5	226,080	57.7	746,430	96.6	186,664	99.0
CA	326,410	22.3	2,424,932	37.2	7,891,984	83.6	2,033,226	93.6
FL	233,207	23.8	1,767,160	45.4	5,616,139	91.4	1,454,928	96.0
GA	132,795	100.0	836,478	100.0	2,762,047	98.3	569,178	99.3
IA	35,246	100.0	198,378	100.0	673,274	99.3	228,071	99.8
IN	74,226	59.5	472,061	86.0	1,778,124	96.5	442,981	98.7
MA	50,612	19.5	402,949	41.4	1,604,211	86.0	387,752	95.1
MD	48,318	100.0	325,350	100.0	1,381,921	97.8	328,588	99.3
MO	82,291	33.0	594,031	50.4	1,746,200	95.7	433,596	98.8
NE	19,955	100.0	106,902	100.0	280,858	99.4	99,080	99.9
NY	168,961	78.6	1,213,666	76.4	4,649,244	82.7	1,029,078	90.7
UT	18,635	12.3	136,499	38.5	471,888	90.1	112,101	96.8
VT	3,457	22.1	35,748	50.0	147,439	84.3	51,500	89.1
WI	52,854	100.0	312,287	100.0	1,186,793	99.4	379,040	99.9

State Ambulatory Services and Surgery Databases, 2018

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	7,377	20.3	166,204	39.6	1,232,767	87.2	785,519	94.6
FL	10,016	23.6	132,292	39.1	1,528,637	78.5	1,484,884	84.3
GA	8,157	99.9	78,728	100.0	1,332,650	99.7	724,698	99.7
IA	4,234	100.0	33,117	100.0	277,466	99.5	185,612	99.6
IN	6,381	54.0	66,837	81.7	579,399	97.7	334,191	98.9
MD	31,394	99.7	237,298	93.8	1,910,636	93.2	1,109,695	95.8
MO	196,417	26.9	1,289,613	49.2	5,786,358	93.5	3,704,544	94.6
NE	2,791	100.0	21,207	100.0	106,268	99.9	70,690	100.0
NY	302,081	68.6	1,760,017	63.6	13,086,092	72.0	6,691,491	80.0
UT	25,951	42.4	144,002	48.8	1,040,871	85.8	584,093	89.5
VT	5,589	27.8	76,930	57.4	862,636	86.6	730,454	86.7
WI	5,185	100.0	55,842	100.0	640,209	99.9	419,255	99.9

State Inpatient Databases, 2017

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	10,105	4.6	3,867	56.6	33,716	96.3	16,332	98.8
AR	40,238	36.2	19,464	76.5	191,597	97.0	149,721	99.5
DE	13,663	100.0	7,174	100.0	48,925	100.0	42,659	100.0
FL	244,353	3.0	100,836	49.4	1,361,291	92.3	1,140,485	97.5
GA	133,641	99.9	40,254	100.0	556,369	100.0	358,970	100.0
IA	41,458	100.0	13,521	100.0	153,864	100.0	131,768	100.0
IN	86,806	74.1	24,173	97.7	372,160	99.3	294,196	99.7
MA	79,851	2.5	25,563	32.9	382,124	88.0	324,077	95.1
MD	71,383	100.0	14,130	100.0	310,404	100.0	217,151	100.0
MO	83,235	16.5	46,287	54.4	414,892	95.5	300,720	98.9
MS	39,381	99.9	16,743	100.0	190,393	100.0	142,489	100.0
NE	27,968	99.9	8,743	100.0	94,699	100.0	76,224	100.0
NM	24,122	99.9	10,440	100.0	100,463	100.0	66,445	100.0
NY	246,906	96.7	92,324	96.4	1,177,322	95.8	845,836	98.9
UT	53,481	30.5	17,646	47.8	149,009	91.9	71,722	97.2
WA	87,978	100.0	19,901	100.0	311,683	100.0	234,877	100.0
VT	5,805	8.5	1,074	62.9	23,579	93.4	23,170	95.3
WI	69,234	100.0	24,499	100.0	284,965	100.0	223,392	100.0

State Emergency Department Databases, 2017

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	35,680	32.4	232,663	60.5	780,058	96.6	185,596	99.2
FL	233,848	25.2	1,722,219	48.1	5,587,034	92.0	1,391,795	96.5
GA	134,927	100.0	832,618	100.0	2,745,174	98.2	553,547	99.5
IA	37,122	100.0	208,336	100.0	691,389	99.2	223,919	99.8
IN	78,133	89.8	496,204	98.0	1,832,152	98.6	431,142	99.5
MA	49,551	19.1	409,317	42.1	1,623,151	86.4	374,165	95.7
MD	50,846	99.9	348,474	100.0	1,413,822	98.2	316,145	99.4
MO	86,395	33.9	642,034	52.0	1,811,350	95.5	432,156	98.9
NE	20,033	100.0	107,115	100.0	277,807	99.3	95,697	99.9
NY	169,454	85.0	1,228,912	84.3	4,590,941	89.3	976,910	96.6
UT	19,975	19.7	140,520	38.0	472,927	90.1	108,113	97.1
VT	3,417	18.1	36,582	51.2	145,974	89.8	48,920	94.0
WI	56,516	100.0	326,544	100.0	1,210,623	99.0	367,336	99.9

State Ambulatory Services and Surgery Databases, 2017

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	9,871	26.6	135,272	44.2	1,520,096	82.1	1,413,156	87.6
GA	7,833	100.0	78,628	100.0	1,294,787	99.8	662,640	99.8
IA	3,929	100.0	33,762	100.0	280,652	99.6	180,499	99.5
IN	6,499	87.1	74,986	97.2	596,580	99.3	327,908	99.1
MD	31,600	99.8	245,010	93.7	1,993,668	93.3	1,111,954	95.8
MO	186,461	27.1	1,287,978	49.2	5,811,029	93.5	3,588,431	94.6
NE	2,813	100.0	21,510	100.0	108,270	99.8	66,870	99.9
NY	302,797	77.7	1,720,977	75.0	12,518,986	82.2	6,091,827	90.7
UT	4,033	19.3	41,232	42.8	316,408	85.0	152,050	86.9
VT	5,821	22.2	77,861	57.8	890,074	91.5	719,052	92.3
WI	6,187	100.0	68,407	100.0	731,565	99.6	476,648	99.7

State Inpatient Databases, 2016

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	10,442	5.9	3,772	55.6	33,909	96.2	15,413	98.9
AR	41,551	36.4	20,443	78.4	192,821	97.3	144,470	99.5
DE	13,963	100.0	7,531	100.0	49,292	100.0	41,331	100.0
FL	247,138	3.2	103,915	53.0	1,375,102	93.0	1,111,447	97.7
GA	136,125	99.9	39,855	100.0	553,407	99.9	340,825	99.9
IA	42,200	100.0	8,488	100.0	136,284	100.0	125,738	100.0
MA	80,012	2.2	25,779	33.9	384,115	88.2	313,157	94.5
MD	73,049	100.0	14,591	99.8	317,624	99.9	217,487	99.9
MS	39,117	100.0	16,516	100.0	188,771	99.9	134,064	99.9
NE	28,052	100.0	8,303	100.0	94,358	99.9	71,925	99.9
NM	25,159	99.8	10,489	99.7	101,092	99.9	63,699	99.8
NY	253,707	97.0	95,081	97.6	1,183,577	96.8	814,708	99.3
UT	55,394	50.4	17,951	46.6	152,372	92.1	70,919	97.2
VT	5,972	9.2	1,102	65.2	23,961	93.5	22,614	94.5
WA	90,880	100.0	20,618	100.0	314,497	100.0	223,593	100.0
WI	70,619	100.0	23,067	100.0	292,414	100.0	216,107	100.0

State Emergency Department Databases, 2016

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	37,017	33.9	233,831	62.8	770,146	96.7	172,342	99.2
FL	241,105	27.2	1,768,710	51.1	5,584,024	92.3	1,290,328	96.6
GA	126,613	100.0	798,318	100.0	2,745,509	98.3	530,107	99.5
IA	35,437	100.0	200,644	100.0	662,530	99.3	209,897	99.9
MA	50,146	17.2	418,968	42.4	1,672,924	87.1	357,998	95.6
MD	55,467	100.0	365,334	100.0	1,464,867	98.1	299,100	99.4
NE	20,819	100.0	109,356	100.0	279,234	99.1	90,448	99.8
NY	181,320	86.4	1,284,387	86.6	4,663,356	94.1	929,930	98.1
UT	20,348	23.2	145,416	39.1	487,303	90.2	105,274	97.1
VT	3,606	17.4	37,132	53.6	151,961	90.2	46,750	93.5
WI	56,342	100.0	327,621	100.0	1,226,883	98.9	343,875	99.9

State Ambulatory Services and Surgery Databases, 2016

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	10,445	31.3	137,210	48.5	1,530,517	85.1	1,384,999	90.1
GA	7,980	100.0	80,171	100.0	1,279,448	99.9	612,686	99.8
IA	3,931	100.0	34,264	100.0	282,797	99.6	175,785	99.6
MD	35,280	99.9	252,638	94.0	2,082,486	93.6	1,103,464	96.6
NE	3,018	100.0	21,387	100.0	109,427	99.7	64,958	99.9
NY	310,491	80.8	1,754,904	79.2	12,422,692	86.5	5,778,083	92.0
UT	4,009	19.6	40,290	42.3	302,365	85.4	144,780	87.9
VT	9,368	24.0	92,736	61.5	908,389	91.6	684,250	92.2
WI	6,117	100.0	68,643	100.0	737,340	99.7	446,671	99.6

State Inpatient Databases, 2015

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AK	10,316	7.0	3,861	54.8	33,373	97.2	14,298	98.4
AR	37,287	39.7	20,966	79.3	191,379	97.4	143,663	99.5
FL	247,343	3.8	106,751	56.7	1,363,476	93.8	1,099,952	98.0
GA	136,934	100.0	39,225	100.0	552,272	99.9	336,541	100.0
IA	42,491	100.0	8,999	100.0	138,515	100.0	129,418	100.0
MA	77,566	2.1	26,803	36.6	379,215	89.5	313,063	95.1
MD	73,987	99.1	16,366	98.5	321,871	99.6	215,967	99.0
MS	39,577	100.0	17,949	100.0	188,766	100.0	134,610	100.0
NE	28,474	100.0	8,829	100.0	93,939	100.0	71,341	100.0
NM	26,099	99.9	11,148	100.0	98,324	100.0	62,142	100.0
NY	255,412	96.7	97,709	97.6	1,185,596	96.7	808,070	99.4
VT	6,178	7.9	1,036	70.1	23,596	94.2	21,944	94.4
UT	55,732	62.2	17,800	44.9	147,871	91.9	68,105	96.4
WA	89,893	100.0	21,539	100.0	314,205	100.0	221,903	100.0
WI	71,500	100.0	24,778	100.0	291,180	100.0	217,976	100.0

State Emergency Department Databases, 2015

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	37,729	37.1	237,730	65.1	765,653	96.9	166,805	99.1
FL	235,712	30.3	1,687,740	54.7	5,367,193	93.2	1,201,080	96.8
GA	125,312	100.0	790,432	100.0	2,700,993	98.6	496,738	99.6
IA	37,294	100.0	209,971	100.0	659,986	99.4	202,376	99.9
MA	46,250	17.8	417,177	44.1	1,671,392	88.3	343,514	96.0
MD	54,996	100.0	377,567	99.7	1,511,506	98.0	294,329	99.4
NE	20,658	100.0	108,787	100.0	279,556	99.2	85,364	99.9
NY	178,768	86.7	1,271,278	87.0	4,636,836	94.3	897,041	98.2
VT	4,008	17.6	38,065	56.1	155,657	90.4	45,434	92.5
UT	21,335	28.1	144,399	41.0	473,913	89.5	98,555	94.5
WI	55,260	100.0	323,308	100.0	1,195,046	98.9	324,503	99.8

State Ambulatory Services and Surgery Databases, 2015

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	10,905	37.1	133,798	52.8	1,537,544	88.0	1,346,910	92.1
GA	7,735	100.0	73,079	100.0	1,271,538	99.9	593,143	99.8
IA	3,801	100.0	33,099	100.0	278,145	99.8	166,368	99.7
MD	37,349	99.7	251,583	92.2	2,178,579	92.7	1,088,975	96.8
NE	2,808	100.0	20,918	100.0	107,603	99.9	61,182	100.0
NY	267,149	82.6	1,363,245	80.1	8,646,261	84.7	3,535,644	93.0
UT	4,189	15.9	40,222	39.8	293,960	85.8	150,217	86.9
VT	13,135	23.9	110,791	64.1	929,188	91.6	638,795	92.0
WI	6,027	100.0	65,959	99.9	733,838	99.6	426,543	99.6

State Inpatient Databases, 2014

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	39,828	34.2	21,207	82.1	190,007	97.6	141,931	99.6
FL	242,555	4.5	107,187	60.5	1,318,042	94.8	1,074,121	98.4
GA	135,233	99.9	38,981	100.0	544,510	99.9	325,180	100.0
IA	42,278	99.6	9,148	99.5	136,090	99.6	126,328	99.6
MA	79,836	2.5	27,152	38.0	381,933	90.5	301,371	95.9
MD	74,307	99.1	17,810	99.3	336,184	99.7	217,624	99.1
MS	40,170	100.0	17,697	100.0	191,012	100.0	129,287	100.0
NE	28,783	99.9	8,850	100.0	94,245	100.0	68,369	100.0
NM	26,232	99.7	11,019	100.0	98,325	99.9	60,553	99.9
NY	260,139	96.7	100,029	97.9	1,207,219	96.6	799,748	99.4
UT	55,723	66.6	16,936	49.4	143,791	93.0	64,794	97.6
VT	6,149	11.8	1,021	92.2	22,446	95.1	19,948	95.2
WA	88,866	100.0	20,564	100.0	310,777	100.0	213,179	100.0
WI	71,672	100.0	26,531	100.0	288,955	100.0	215787	100.0

State Emergency Department Databases, 2014

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	37,088	33.5	241,116	67.0	777,159	97.1	156,517	99.0
FL	238,245	35.5	1,683,448	58.4	5,057,572	94.0	1,099,737	97.1
GA	123,936	100.0	795,516	100.0	2,631,745	98.6	459,599	99.5
IA	36,631	100.0	206,734	100.0	635,893	99.5	191,308	99.8
MA	47,006	19.4	421,637	44.1	1,688,448	88.5	326,811	95.5
MD	37,088	33.5	241,116	67.0	777,159	97.1	156,517	99.0
NE	18,619	100.0	104,645	100.0	288,680	99.2	82,120	99.8
NY	181,754	86.1	1,297,536	86.7	4,542,667	94.6	884,135	98.4
UT	19,924	18.7	143,198	38.5	456,130	90.6	91,066	96.6
VT	3,823	30.2	37,851	62.1	154,141	91.0	43,072	91.4
WI	54,935	100.0	319,763	100.0	1,135,122	99.0	292,673	99.9

State Ambulatory Services and Surgery Databases, 2014

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	10,781	44.3	129,387	57.1	1,483,578	90.5	1,314,474	93.7
GA	8,539	100.0	77,594	100.0	1,235,715	99.9	560,001	99.9
IA	3,803	100.0	31,086	100.0	273,792	99.8	160,202	99.8
MD	37,913	99.3	260,899	92.9	2,219,260	93.1	1,076,903	96.6
NE	2,244	100.0	18,295	100.0	105,798	100.0	58,741	100.0
NY	261,986	82.8	1,333,326	81.0	8,398,472	84.6	3,306,292	93.2
UT	3,683	16.2	34,864	40.6	240,650	88.2	118,046	89.8
VT	9,452	31.9	87,500	69.1	924,715	92.0	634,915	91.4
WI	5,493	100.0	63,544	99.9	704,409	99.7	396,105	99.7

State Inpatient Databases, 2013

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	40,456	37.3	20,406	84.5	184,796	97.9	146,096	99.6
FL	239,661	5.3	109,438	63.7	1,279,462	95.4	1,044,819	98.6
GA	132,629	100.0	41,354	100.0	547,905	100.0	324,283	100.0
IA	41,748	98.5	9,605	97.4	136,008	98.0	130,451	97.6
MA	80,738	2.9	28,986	40.7	385,390	91.6	299,585	96.6
MD	72,998	99.9	18,772	99.9	351,570	99.7	224,326	99.2
MS	34,823	100.0	17,453	100.00	175,913	100.0	119,501	99.8
NE	28,016	100.0	8,464	100.0	97,172	100.0	71,068	100.0
NM	27,138	98.8	10,099	98.2	99,684	98.2	64,305	99.0
NY	261,747	96.5	101,136	97.7	1,226,412	96.5	829,974	99.5
UT	55,885	66.8	16,851	46.0	141,203	93.3	65,374	97.6
VT	6,109	10.5	1,240	76.9	23,771	94.5	20,090	95.7
WA	86,147	100.0	22,058	100.0	309,076	100.0	213,748	100.0
WI	71,294	100.0	26,690	100.0	295,110	100.0	218,637	100.0

State Emergency Department Databases, 2013

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	36,268	35.6	239,240	69.6	738,900	97.1	148,438	99.2
FL	232,784	39.8	1,593,749	61.4	4,738,985	94.6	1,009,708	97.4
GA	129,229	100.0	815,113	100.0	2,551,666	98.6	434,993	99.5
IA	34,890	100.0	200,413	100.0	616,771	99.2	183,248	99.9
MA	48,272	19.2	424,028	43.6	1,691,214	88.0	322,638	93.3
MD	56,989	100.0	392,742	100.0	1,515,363	97.5	258,977	99.4
NE	17,217	100.0	99,025	100.0	286,720	99.4	77,780	99.9
NY	188,120	86.4	1,317,888	87.1	4,467,234	95.0	790,824	98.7
UT	19,918	20.2	138,390	38.7	440,646	90.7	84,416	96.3
VT	3,848	27.3	39,481	64.3	157,738	91.6	41,558	92.6
WI	50,098	100.0	302,630	100.0	1,071,720	99.3	279,722	99.9

State Ambulatory Surgery and Services Databases, 2013

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	10,418	47.9	132,402	60.3	1,445,382	92.3	1,311,089	95.1
GA	9,532	100.0	81,302	100.0	1,214,699	100.0	534,489	99.9
IA	3,702	100.0	32,309	100.0	266,937	99.9	157,255	99.9
MD	36,492	99.6	256,438	93.4	2,182,639	93.0	1,062,070	96.5
NE	1,982	100.0	16,793	100.0	104,911	99.9	56,198	99.9
NY	263,402	83.2	1,342,074	82.3	8,291,434	85.2	3,142,411	94.2
UT	4,197	15.9	37,718	39.5	243,943	89.6	118,439	91.0
VT	7,324	29.1	78,756	69.7	915,232	92.9	617,105	92.2
WI	5,797	99.0	66,228	98.4	712,191	96.9	390,419	97.4

State Inpatient Databases, 2012

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	41,844	43.1	20,702	85.5	191,432	97.4	152,206	98.4
FL	239,281	5.6	109,906	66.5	1,279,144	95.8	1,042,061	98.7
GA	138,506	100.0	43,364	100.0	555,605	99.9	324,273	100.0
IA	41,766	5.3	10,423	38.1	141,470	74.8	134,633	83.6
MA	81,881	2.9	30,138	43.7	400,621	92.7	306,624	97.3
MD	74,727	11.7	21,324	31.7	368,940	19.8	230,022	17.5
NE	28,087	100.0	9,948	100.0	96,568	100.0	71,021	100.0
NM	27,572	97.2	11,005	97.8	100,258	97.6	60,143	98.8
NY	265,864	96.0	106,974	97.8	1,295,664	96.5	860,854	99.6
UT	56,321	64.7	17,253	45.7	143,130	94.2	64,785	98.6
VT	6,081	10.1	1,305	78.0	24,327	95.9	20,467	96.7
WA	87,051	100.0	24,194	100.0	318,154	100.0	211,472	100.0

State Emergency Department Databases, 2012

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	229,459	42.3	1,567,860	64.0	4,631,580	95.1	956,475	97.7
GA	140,870	100.0	862,042	100.0	2,616,053	98.6	423,997	99.5
IA	32,095	22.4	216,686	40.6	631,899	81.9	180,576	88.7
MA	50,426	18.0	442,934	44.5	1,740,138	88.4	316,134	92.8
NE	19,667	100.0	107,154	100.0	275,176	99.1	73,366	100.0
NY	195,105	86.7	1,358,648	87.8	4,504,692	95.4	756,454	98.8
UT	19,453	11.3	140,525	35.4	439,728	92.1	80,153	97.6
VT	4,110	30.7	41,541	68.9	160,923	93.3	41,329	95.5

State Ambulatory Surgery and Services Databases, 2012

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	10,451	48.9	131,864	63.2	1,460,695	94.2	1,292,648	96.4
GA	10,978	100.0	85,101	100.0	1,254,490	100.0	518,497	99.9
IA	3,405	15.5	32,343	37.3	263,562	74.1	152,964	79.8
NE	2,375	100.0	18,800	100.0	102,210	99.9	53,539	100.0
NY	258,723	83.8	1,260,648	83.7	7,917,091	85.9	2,846,115	94.9
UT	4,674	11.3	37,333	38.8	224,931	90.9	102,669	91.7
VT	7,534	27.0	85,133	72.4	918,812	94.2	587,381	93.8

State Inpatient Databases, 2011

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	42,997	48.1	20,727	85.9	192,749	97.9	153,462	99.6
CA	554,710	7.1	192,513	49.4	1,987,290	88.3	1,198,000	97.4
FL	239,790	5.5	111,404	68.9	1,276,250	96.0	1,028,672	98.8
GA	137,869	100.0	44,280	100.0	565,876	99.9	324,988	100.0
IA	41,667	2.6	11,333	28.3	144,532	69.1	140,035	80.9
MA	83,107	3.6	33,745	44.9	410,153	93.5	322,941	97.7
MS	32,490	12.5	20,579	83.0	199,393	92.4	137,348	91.6
NE	28,263	100.0	9,975	100.0	99,495	100.0	74,366	100.0
NM	28,409	95.6	11,862	98.8	104,959	97.6	61,479	97.5
NY	268,909	95.6	111,087	97.8	1,321,384	96.0	877,212	99.5
UT	56,613	57.9	16,291	43.4	143,668	92.7	64,199	97.7
VT	6,117	9.8	1,516	76.9	24,627	87.0	19,951	86.2
WA	88,854	100.0	25,729	100.0	325,198	100.0	208,288	100.0

State Emergency Department Databases, 2011

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	359,619	27.7	2,244,368	44.6	6,206,312	87.3	1,313,903	96.0
FL	217,616	44.8	1,439,944	66.1	4,355,028	95.2	873,179	97.8
GA	132,319	100.0	795,461	100.0	2,502,236	98.5	386,365	99.5
IA	31,988	18.1	221,375	37.4	617,924	78.6	170,191	87.6
MA	49,307	20.2	445,314	45.4	1,709,624	89.2	304,156	92.8
NE	19,352	100.0	106,494	100.0	270,207	98.9	69,745	99.9
NY	196,430	86.5	1,371,705	88.3	4,379,886	95.9	697,750	98.8
UT	20,464	10.2	140,825	33.4	428,533	92.2	76,051	97.2
VT	3,841	33.7	41,229	64.0	158,535	80.7	39,074	81.3

State Ambulatory Surgery and Services Databases, 2011

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	8,610	26.9	179,433	46.8	1,209,851	91.9	675,698	96.5
FL	10,976	52.1	139,903	66.3	1,513,911	95.5	1,258,393	97.4
GA	11,312	100.0	87,936	100.0	1,259,472	99.9	489,893	99.9
IA	3,584	13.6	33,036	30.4	260,810	63.9	147,611	71.9
NE	2,628	100.0	19,795	100.0	102,813	99.9	53,024	100.0
NY	7,893	99.0	132,406	98.6	1,376,624	97.7	655,202	99.8
UT	5,391	12.6	39,283	38.2	230,641	92.4	100,677	92.6
VT	8,489	31.5	87,299	68.7	918,190	83.5	563,044	83.4

State Inpatient Databases, 2010

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	42,862	56.5	20,059	86.2	194,910	98.0	154,136	99.6
CA	564,911	7.3	198,865	51.2	1,998,102	88.3	1,208,263	97.5
FL	241,766	6.1	110,016	70.7	1,266,088	96.0	1,022,113	98.9
GA	141,016	100.0	46,412	100.0	573,881	100.0	325,907	100.0
IA	42,516	3.0	11,231	29.0	145,762	65.3	141,746	75.4
MA	82,779	3.8	33,784	47.9	408,199	94.0	321,250	97.9
MS	30,162	15.8	19,435	86.3	191,645	96.0	134,395	98.1
NC	130,423	9.1	46,206	50.7	569,558	73.6	383,129	76.4
NE	29,062	100.0	9,826	100.0	101,992	100.0	78,045	100.0
NM	29,017	96.1	12,462	98.7	105,757	97.9	61,821	97.7
NY	273,146	95.4	113,481	96.9	1,340,145	94.0	885,575	99.0
UT	57,626	57.2	15,288	42.0	140,726	92.7	60,770	97.4
WA	89,103	100.0	27,294	100.0	327,885	100.0	207,486	100.0

State Emergency Department Databases, 2010

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	366,288	28.4	2,188,741	45.6	5,968,456	87.4	1,213,911	96.0
FL	215,640	47.4	1,390,084	67.8	4,159,865	95.2	836,457	97.9
GA	141,400	100.0	815,547	100.0	2,388,997	98.5	360,596	99.6
IA	31,946	16.4	210,199	37.3	597,782	75.7	167,297	83.2
MA	50,342	22.6	438,302	48.0	1,695,199	89.5	294,067	93.2
NC	92,944	30.9	670,615	51.0	2,458,847	76.7	401,007	78.5
NE	20,154	100.0	106,199	100.0	261,563	98.6	75,385	99.8
NY	196,812	86.7	1,326,578	88.3	4,149,237	94.2	663,130	98.3
UT	20,800	11.2	138,206	34.0	415,136	91.6	74,589	96.7

State Ambulatory Surgery and Services Databases, 2010

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	9,236	28.3	182,226	47.3	1,282,536	92.0	701,146	96.1
FL	11,716	51.4	143,722	68.1	1,574,434	96.2	1,284,377	98.1
GA	12,152	100.0	87,229	100.0	1,202,825	100.0	449,068	100.0
IA	3,885	11.8	32,446	29.2	253,248	59.1	150,379	64.7
NC	13,034	22.7	177,358	46.1	973,012	64.2	475,476	61.1
NE	2,747	100.0	19,438	100.0	103,327	100.0	54,386	99.9
NY	5,580	98.4	85,706	92.1	852,743	82.7	412,752	98.8
UT	5,481	12.0	38,337	37.0	221,286	88.5	96,834	90.0

State Inpatient Databases, 2009

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	45,214	65.0	22,142	85.6	195,911	98.3	154,867	99.8
CA	585,245	5.5	206,366	52.1	2,000,666	88.2	1,192,387	97.6
FL	251,382	5.8	111,325	71.9	1,261,315	95.9	982,054	98.9
IA	43,684	2.8	12,373	30.5	148,533	65.9	144,365	77.1
NC	135,811	9.4	48,804	51.7	567,120	73.7	375,068	77.0
NE	30,303	99.9	10,174	100.0	98,770	100.0	76,907	100.0
NM	30,239	97.2	13,523	98.9	107,868	98.0	60,743	97.6
NY	279,861	95.3	120,927	96.9	1,363,573	93.6	897,257	98.8
UT	59,507	55.6	15,545	40.3	142,322	92.9	59,351	98.2
WA	92,138	100.0	27,809	100.0	328,727	100.0	203,993	100.0

State Emergency Department Databases, 2009

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	394,223	28.9	2,375,278	46.6	5,933,157	87.3	1,172,607	96.0
FL	235,897	51.4	1,480,495	70.8	4,040,055	95.2	776,721	98.0
NC	105,337	32.1	751,923	52.4	2,476,967	76.5	440,515	78.9
NE	22,781	100.0	116,277	100.0	255,074	99.1	74,264	99.8
NY	208,321	85.3	1,465,813	87.8	4,127,941	94.2	635,494	98.4
UT	24,565	9.6	158,767	33.1	433,969	91.8	72,088	96.9

State Ambulatory Surgery and Services Databases, 2009

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	9,843	28.8	184,331	48.6	1,416,182	91.6	765,289	96.0
FL	14,326	46.2	138,063	71.0	1,616,675	96.6	1,301,674	98.3
NC	13,669	26.2	175,108	47.4	950,338	64.4	451,080	61.5
NE	1,709	100.0	16,610	100.0	97,129	99.9	52,852	99.7
NY	8,775	99.0	141,282	91.7	1,409,196	82.8	666,165	99.3
UT	5,293	9.4	36,795	35.3	191,160	94.0	78,060	94.6

State Inpatient Databases, 2008

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	45,795	68.7	21,475	85.8	197,452	98.3	160,394	99.8
CA	612,708	5.5	199,522	54.3	2,006,150	87.1	1,199,350	97.5
FL	260,731	5.6	108,399	72.0	1,234,624	95.2	967,968	98.9
NC	140,827	9.6	47,067	52.7	569,233	71.4	376,886	74.8
NE	28,195	99.8	9,601	100.0	95,259	99.8	82,421	100.0
NY	278,026	86.4	116,578	88.7	1,343,000	91.6	891,549	98.7
UT	62,002	57.4	15,082	42.6	142,735	92.9	59,648	98.5
WA	94,611	100.0	27,679	100.0	325,906	100.0	204,116	100.0

State Emergency Department Databases, 2008

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	378,350	29.6	1,999,440	47.1	5,534,462	86.7	1,120,595	95.6
FL	219,843	49.2	1,252,403	69.7	3,763,524	94.9	742,369	98.0
NC	103,572	32.5	664,834	51.7	2,270,011	73.2	367,417	74.7
NE	20,622	100.0	100,447	99.9	237,883	99.1	71,622	99.7
NY	203,056	83.5	1,313,716	86.8	3,895,188	93.8	607,766	98.3
UT	25,313	10.0	148,214	35.3	440,314	91.2	73,309	96.6

State Ambulatory Surgery and Services Databases, 2008

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	10,405	32.3	191,981	49.2	1,712,134	90.1	937,650	94.4
FL	14,864	47.3	136,925	71.2	1,670,260	96.9	1,310,561	98.5
NC	14,416	30.3	162,534	48.5	905,289	65.5	425,546	66.7
NE	1,669	100.0	15,597	100.0	88,762	99.9	51,071	99.8
NY	9,104	90.2	138,337	84.7	1,324,454	82.0	629,602	99.0
UT	4,733	7.6	34,865	38.2	188,989	95.1	71,356	96.6

State Inpatient Databases, 2007

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	47,119	82.2	23,008	85.5	198,589	98.2	159,252	99.8
AZ	115,917	96.7	37,643	97.4	384,047	98.2	237,973	99.5
CA	630,527	5.0	196,930	55.6	2,002,684	87.1	1,182,402	97.5
FL	269,963	6.0	109,591	72.4	1,230,170	94.9	953,606	98.9
NC	141,105	13.5	46,588	54.9	562,470	72.6	370,135	76.0
NE	29,066	99.9	9,990	100.0	93,990	99.8	79,577	100.0
NV	43,547	36.5	11,155	41.0	153,146	81.7	81,679	88.1
NY	277,128	86.4	122,460	89.8	1,334,075	94.2	874,927	99.3
UT	61,268	58.7	15,481	45.5	142,132	93.4	60,051	98.7
WA	94,506	41.4	27,658	42.1	321,773	33.7	200,910	34.0

State Emergency Department Databases, 2007

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AZ	85,748	96.0	389,029	93.7	1,075,792	95.7	208,971	99.1
CA	377,042	29.5	1,962,937	47.3	5,376,070	85.8	1,075,002	93.5
FL	219,728	46.8	1,222,668	69.0	3,625,210	94.9	702,066	98.1
NC	103,220	34.4	660,039	52.1	2,171,606	72.1	349,324	72.0
NE	21,571	100.0	104,787	100.0	227,030	99.4	65,139	99.8
NY	197,217	84.4	1,267,357	87.4	3,558,764	96.1	559,385	99.1
UT	25,263	10.6	150,736	37.1	440,707	91.6	70,263	96.6

State Ambulatory Surgery and Services Databases, 2007

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	10,375	37.0	187,822	52.2	1,815,642	90.8	984,808	94.4
FL	14,927	43.7	138,427	73.4	1,683,974	97.1	1,257,278	98.8
NC	12,036	24.6	160,090	35.8	889,708	47.7	392,402	50.0
NE	2,188	100.0	17,612	100.0	98,395	99.8	61,982	99.8
NY	8,662	90.2	125,344	92.8	1,135,203	98.6	527,862	99.7
UT	4,728	7.8	33,770	40.6	188,478	95.8	69,614	97.1

State Inpatient Databases, 2006

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	46,640	80.6	22,714	84.9	198,642	98.1	161,634	99.7
AZ	115,758	96.9	37,377	97.3	378,767	98.2	236,600	99.5
CA	626,137	5.1	200,097	57.8	1,978,294	87.7	1,192,374	97.8
FL	268,967	6.5	111,248	74.2	1,212,492	95.0	958,311	98.9
NC	137,025	14.8	46,672	54.3	561,755	71.4	370,733	73.8
NE	29,042	99.9	9,820	100.0	93,619	99.4	80,125	99.9
NV	42,283	46.2	10,218	53.2	150,015	93.8	82,638	98.4
NY	286,449	86.1	125,410	89.5	1,358,888	94.2	888,247	99.5
UT	59,457	57.0	14,848	48.8	138,916	94.2	59,173	99.0
WA	92,143	100.0	27,567	100.0	315,643	100.0	198,675	100.0

State Emergency Department Databases, 2006

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AZ	80,522	96.2	368,327	94.1	1,017,179	96.1	201,996	99.1
CA	358,400	30.8	1,884,820	48.4	5,232,509	85.6	1,052,777	94.0
FL	221,362	51.9	1,275,674	71.5	3,649,681	94.8	703,314	98.1
NE	21,619	100.0	102,007	100.0	213,182	99.1	63,709	99.5
NY	203,079	83.8	1,286,823	87.1	3,566,588	96.0	563,590	99.0
UT	25,667	13.8	151,413	38.9	429,040	92.4	68,706	97.1

State Ambulatory Surgery and Services Databases, 2006

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	10,650	38.3	183,118	54.7	1,750,397	92.4	930,637	95.4
FL	15,261	43.7	135,629	75.8	1,616,070	97.4	1,178,266	99.0
NC	14,196	38.9	187,592	54.7	1,031,812	70.1	389,829	68.7
NE	2,602	100.0	19,180	100.0	103,981	99.8	68,596	99.9
NY	7,314	91.1	115,314	93.1	1,025,678	98.7	460,268	99.7
UT	4,067	13.2	34,958	42.5	191,037	96.4	74,365	96.6

State Inpatient Databases, 2005

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	44,961	81.3	22,416	84.4	197,648	98.2	163,993	99.7
AZ	108,992	91.2	37,825	96.7	362,706	97.9	236,015	99.5
CA	615,356	5.3	207,292	59.9	1,966,134	88.5	1,201,198	98.0
FL	260,668	7.3	113,752	76.4	1,189,067	95.4	971,121	99.0
NC	132,902	14.1	47,134	55.5	547,597	69.5	367,859	71.7
NE	26,230	99.9	9,485	100.0	84,127	99.2	72,393	99.7
NV	39,840	52.2	10,426	64.1	145,126	96.2	80,561	98.6
NY	283,111	86.5	126,851	89.5	1,346,698	94.2	889,709	99.4
UT	57,452	57.6	15,555	50.1	135,239	94.1	60,387	96.7
WA	88,036	100.0	28,073	100.0	304,791	100.0	196,153	100.0

State Emergency Department Databases, 2005

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AZ	85,391	91.4	391,569	90.2	1,006,070	96.3	205,364	99.2
CA	355,358	32.9	1,946,166	50.5	5,219,670	84.8	1,038,997	93.7
FL	219,289	58.4	1,258,138	74.2	3,572,975	95.2	707,533	98.1
NE	18,896	100.0	92,697	100.0	185,203	99.2	55,838	99.6
UT	26,284	13.4	159,082	38.8	416,383	91.8	66,835	95.2

State Ambulatory Surgery and Services Databases, 2005

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
CA	10,768	41.5	179,092	57.0	1,693,309	93.6	907,690	96.2
FL	14,556	47.4	131,253	79.3	1,519,009	97.9	1,135,950	99.1
NC	13,136	42.7	184,258	54.7	1,009,371	67.1	369,422	66.1
NE	1,797	100.0	18,465	99.9	97,100	99.0	58,857	99.8
NY	13,576	84.9	146,023	90.4	1,092,680	98.3	461,604	99.6
UT	4,101	20.1	36,688	46.1	190,790	96.8	76,870	96.5

State Inpatient Databases, 2004

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AR	44,366	83.3	22,226	84.7	198,100	98.4	164,958	99.6
AZ	105,002	63.9	35,588	79.1	350,360	95.9	226,044	99.1
CA	609,724	5.7	208,575	63.8	1,956,858	89.8	1,182,267	98.3
FL	250,408	7.7	115,312	78.7	1,155,435	96.2	969,521	99.1
NC	129,195	14.4	46,549	53.2	541,367	67.5	365,218	69.9
NE	24,715	99.9	8,971	99.6	79,542	99.6	68,349	99.3
NV	37,137	55.7	9,798	69.1	134,496	96.9	76,500	98.8
NY	287,629	94.1	129,782	97.2	1,355,708	95.5	887,860	99.4
UT	57,090	58.4	14,877	47.0	134,435	94.4	59,778	96.5
WA	86,437	100.0	26,374	100.0	296,444	100.0	187,384	100.0

State Emergency Department Databases, 2004

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
NE	17,540	100.0	85,828	100.0	175,521	99.0	53,701	99.2
UT	25,253	15.1	147,329	39.1	394,328	92.1	61,390	95.6

State Ambulatory Surgery and Services Databases, 2004

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
FL	11,631	62.2	135,055	81.5	1,483,788	98.4	1,116,948	99.4
NC	10,419	42.4	155,996	52.6	883,811	64.3	348,958	63.8
NE	1,626	100.0	20,022	99.2	95,810	99.6	57,830	99.6
NY	6,750	98.2	103,963	98.2	907,074	98.8	420,631	99.4
UT	3,974	20.9	38,277	47.4	187,803	97.6	73,050	97.2

State Inpatient Databases, 2003

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
AZ	100,663	59.8	34,574	70.5	323,865	95.5	204,318	99.2
CA	609,241	6.7	215,088	66.1	1,951,540	90.2	1,203,490	98.4
NC	128,121	13.4	49,656	48.6	531,725	63.7	359,191	66.9
NE	27,920	100.0	10,270	99.8	91,634	99.7	76,520	100.0
NV	35,481	54.1	9,465	73.1	124,658	97.1	71,157	99.1
NY	279,299	94.9	124,294	97.1	1,271,074	96.1	843,251	99.8
UT	56,112	59.6	15,315	49.0	131,432	95.4	58,039	97.4
WA	85,069	100.0	26,824	100.0	291,333	100.0	185,787	100.0

State Emergency Department Databases, 2003

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
NE	21,333	100.0	99,660	100.0	196,442	98.7	57,874	99.9
UT	27,103	15.6	161,138	39.6	390,579	93.7	60,347	97.3

State Ambulatory Surgery and Services Databases, 2003

State	Age in Years							
	0		1-17		18-64		65+	
	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified	Number of Total Records	Percent Verified
NC	10,385	40.8	136,476	50.8	786,155	62.7	327,328	62.7
NE	2,171	100.0	27,813	99.6	115,113	99.3	65,771	99.5
NY	11,511	96.8	125,193	97.9	811,543	99.2	361,368	99.8
UT	3,810	24.1	35,423	47.8	173,395	97.7	67,226	96.8

APPENDIX F: SAS CODE FOR USAGE EXAMPLES

Usage Example #1: Assigning Patient Characteristics

```
** Assigning Attributes

** combined event data -- combine all available data types for the years;
** for simplicity, the example uses only 2 attributes: AGE and ZIPINC_QRTL;
data NE_CombinedEvents1;
  keep KEY visitLink DaysToEvent AGE ZIPINC_QRTL
       events   sidEvents   seddEvents   sidSeddEvents   sasdEvents
       verified sidVerified seddVerified sidSeddVerified sasdVerified;
  merge NE_2005_Revisit_Core (in=_inDaysToEvent)
        NE_2006_Revisit_Core (in=_inDaysToEvent)
        NE_SID_2005_Core (in=_inSID_2005)
        NE_SID_2006_Core (in=_inSID_2006)
        NE_SASD_2005_Core (in=_inSASD_2005)
        NE_SASD_2006_Core (in=_inSASD_2006)
        NE_SEDD_2005_Core (in=_inSEDD_2005)
        NE_SEDD_2006_Core (in=_inSEDD_2006)
        end=lastObs;
  by KEY;

  ** indicator for all events;
  events = 1;
  if _inDaysToEvent then verified = 1;
  else                   verified = 0;

  ** indicator for SID events;
  if _inSID then do;
    sidEvents = 1;
    if _inDaysToEvent then sidVerified = 1;
    else                   sidVerified = 0;
  end;

  ** indicator for SEDD events;
  if _inSEDD then do;
    seddEvents = 1;
    if _inDaysToEvent then seddVerified = 1;
    else                   seddVerified = 0;
  end;

  ** indicator for SID/SEDD events;
  sidSeddEvents = max(sidEvents, seddEvents);
  sidSeddVerified = max(sidVerified, seddVerified);

  ** indicator for SASD events;
  if _inSASD then do;
    sasdEvents = 1;
    if _inDaysToEvent then sasdVerified = 1;
    else                   sasdVerified = 0;
  end;
run;


** sort the combined events into link order;
proc sort data=NE_CombinedEvents1;
  by visitLink DaysToEvent;
```

Usage Example #1: Assigning Patient Characteristics (cont'd)

```
** use the first non-missing value for link ID attributes;
data NE_LinkAttribs2;
  keep visitLink foundAGE foundZIP;
  set NE_CombinedEvents1;
  by visitLink DaysToEvent;
  where visitLink;  ** only process events with a visitLink ID;

  ** set attributes to missing for each new verified patient;
  length foundZIP $5;
  retain foundAGE foundZIP;
  if first.visitLink then do;
    foundAGE = .;
    foundZIP = '';
  end;

  ** select the first non-missing attribute;
  if foundAGE le .Z and AGE gt .Z then foundAGE = AGE;
  if foundZIP eq '' and ZIPINC_QRTL ne '' then foundZIP = ZIPINC_QRTL;

  ** create one set of attributes for each verified patient;
  if last.visitLink then output;
run;


** apply the consistent attributes to the event data;
data NE_CombinedEvents2;
  keep KEY visitLink DaysToEvent AGE ZIPINC_QRTL
       events   sidEvents   seddEvents   sidSeddEvents   sasdEvents
       verified sidVerified seddVerified sidSeddVerified sasdVerified;
  merge NE_CombinedEvents1
        NE_LinkAttribs2 (in=_inLinkAttribs)
  by visitLink;

  ** apply uniform attributes to verified patient events;
  if _inLinkAttribs then do;
    AGE = foundAGE;
    ZIPINC_QRTL = foundZIP;
  end;
run;
```

Usage Example #2: Revisits for Selected Patients

```
** Example 2, Follow-up Care
** Program code

** diagnosis CCS code to examine and clean period (months);
%let condX = 50;        ** diabetes mellitus with complications;
%let cleanPeriod = 6;   ** number of months for "clean" period with no condX claims;
%let firstYear = 2005;  ** first year of data;
%let lastYear  = 2006;  ** last year of data;


** (1) combine event  and revisit data -- keep only events with the specified condition;
data NE_EventsCondX1;
  keep KEY visitLink DaysToEvent servSetting YEAR DQTR AMONTH LOS;
  merge NE_2005_Revisit_Core (in=_inDaysToEvent)
        NE_2006_Revisit_Core (in=_inDaysToEvent)
        NE_SID_2005_Core (in=_inSID)
        NE_SID_2006_Core (in=_inSID)
        NE_SASD_2005_Core (in=_inSASD)
        NE_SASD_2006_Core (in=_inSASD)
        NE_SEDD_2005_Core (in=_inSEDD)
        NE_SEDD_2006_Core (in=_inSEDD)
        end=lastObs;
  by KEY;

  ** (1.a) limit data to linkable patients;
  if _inDaysToEvent and (_inSID or _inSASD or _inSEDD);

  ** service type indicator;
  select;
    when (_inSID)  servSetting = 'IP';
    when (_inSEDD) servSetting = 'ED';
    when (_inSASD) servSetting = 'AS';
    otherwise;
  end;

  ** (1.b) grab all events with condX;
  if _n_ eq 1 then put "Searched CCS diagnoses codes for values of '&condX'";
  array DXCCS {*} DXCCS1-DXCCS15;
  do i = 1 to NDX;
    if DXCCS{i} eq &condX then output NE_EventsCondX1;
  end;
run;


** (2) sort the combined events into visitLink (patient), service sequence order;
proc sort data=NE_EventsCondX1;
  by visitLink DaysToEvent;
run;
```

Usage Example #2: Revisits for Selected Patients (cont'd)

```
** (3) find people with 2+ condX related events,
** calculate days between the 1st and 2nd event;
data NE_EventsCondX2;
  keep visitLink patientCount patientEvents servSetting1 servSetting2 days_E1toE2;
  set NE_EventsCondX1
      end=lastObs;
  by visitLink DaysToEvent;

  retain patientCount 1;
  label patientCount  = 'count of patients'
        patientEvents = 'number of events for patient'
        servSetting1  = 'type of service for the initial event'
        servSetting2  = 'type of service for the second event'
        days_E1toE2   = 'days between initial and second event';

  retain _condX_events;
  _condX_events + 1;
  _dayLag = lag(DaysToEvent);

  retain _patients _pat_w2Plus _pat_wCleanPeriod _cleanPeriod days_E1toE2 patientEvents 0
         servSetting1 servSetting2;
  if first.visitLink then do;
    _patients + 1;  ** count patients with condX;

    ** reset patient indicators and counters;
    days_E1toE2 = .;
    patientEvents = .;
    servSetting1 = '  ';
    servSetting2 = '  ';

    if not (first.visitLink and last.visitLink) then _pat_w2Plus + 1;

    ** (3.a.i) first claim must be after "cleanPeriod" month of first data year;
    if (YEAR gt &firstYear) or  /* assumes clean period (months) < 12 */
       ( YEAR eq &firstYear and
         DQTR gt &cleanPeriod/3 and
         AMONTH gt &cleanPeriod and
         LOS lt &cleanPeriod*30 ) then do;
      _cleanPeriod = 1;  ** indicator that patient had clean period;
      servSetting1 = servSetting;
      patientEvents = 1;  ** counter for number of patient events;
    end;  /* end-if (clean period) */
    else _cleanPeriod = 0;
  end;  /* end-if (first visitLink) */

  else do;  /* not first visitLink */
    ** (3.b) revisit - clean period already found;
    if _cleanPeriod then do;
      patientEvents + 1;  ** count number of events for this patient;
      if patientEvents eq 2 then do;
        days_E1toE2 = DaysToEvent - _dayLag;
        servSetting2 = servSetting;
        _pat_wCleanPeriod + 1;  ** count patients with a clean period;
      end;  /* end-if (second event) */
    end;  /* end-if (clean period) */

    else do;  /* clean not (yet) period found */
      ** (3.a.ii) no clean pd yet found - check lag days f/ clean pd between events;
      if _dayLag/30 gt &cleanPeriod then do;  /* 99% correct */
        _cleanPeriod = 1;  ** indicator that patient had clean period;
        servSetting1 = servSetting;
        patientEvents = 1;  ** counter for number of patient events;
      end;  ** end-if (lag clean period);
    end;  /* end-else (clean period not found) */
  end;  /* end-else (not first visitLink) */

  ** output one obs per visitLink;
  if last.visitLink and patientEvents ge 2 then output;
```

Usage Example #2: Revisits for Selected Patients (cont'd)

```
  ** (3.c) summarize processing;
  if lastObs then do;
    put '================================================================================';
    put "Processing summary -- events with diagnosis (CCS) category: &condX";
    put '-started with ' _condX_events 'events (total)';
    put '          for ' _patients 'patients.';
    put '-there were ' _pat_w2Plus "patients with 2+ DXCCS '&condX' events";
    put "-clean period, no claim with DXCCS '&condX' for at least &cleanPeriod months";
    put ' before the first claim: ' _pat_wCleanPeriod ;
    put '================================================================================';
    put /;
  end;
run;


proc format;
  picture pctfmt low-high='009 %';
run;


** (4) statistics for the number of condX related events;
title1 "Number of DXCCS &condX Events - Distribution";
title2 "for Patients with Multiple DXCCS &condX Events";
proc means data=NE_EventsCondX2 maxdec=2 mean p25 p50 p75 max;
  var patientEvents;
run;


** (5) summarize revisits by the initial and second service settings;
title "Count and Days for DXCCS '&condX' Patients with Multiple Hospital Events";
proc tabulate data=NE_EventsCondX2 format=comma12.;
  class servSetting1 servSetting2 /descending;
  var patientCount;
  table (servSetting1 all),
        (servSetting2 all)*
        (patientCount*sum*f=comma12.
         days_E1toE2*(mean median)*f=8.1);
run;
```

Usage Example #2: Revisits for Selected Patients (cont'd)

Output

Number of DXCCS 50 Events - Distribution
for Patients with Multiple DXCCS 50 Events

The MEANS Procedure

Analysis Variable : patientEvents number of events for patient

Mean	25th Pctl	50th Pctl	75th Pctl	Maximum
4.14	2.00	3.00	4.00	97.00

Count and Days for DXCCS '50' Patients with Multiple Hospital Events

	type of service for the second event											
	IP			ED			AS			All		
	count of patients	days between initial and second event		count of patients	days between initial and second event		count of patients	days between initial and second event		count of patients	days between initial and second event	
	Sum	Mean	Median	Sum	Mean	Median	Sum	Mean	Median	Sum	Mean	Median
initial event												
IP	1,850	61.6	6.0	367	102.8	35.0	157	140.3	111.0	2,374	73.2	14.0
ED	254	122.0	75.0	299	93.3	34.0	40	123.0	86.5	593	107.6	52.0
AS	158	151.3	120.0	24	114.0	115.5	466	41.6	14.0	648	71.0	21.0
All	2,262	74.7	16.0	690	99.1	37.0	663	69.9	21.0	3,615	78.5	21.0

Usage Example #3: Preceding Visits to any Hospital Setting for Selected Patients

```
** Example 3, Preceding Events
** Program code

** procedure CCS code to examine;
%let servX = 44;        ** CABG;


** combine event  and revisit data -- flag events with the specified service;
data TN_AllEvents;
  keep KEY visitLink DaysToEvent servX dxCcs1 servSetting events;
  merge TN_2005 _Revisit_Core (in=_inDaysToEvent)
        TN_2006 _Revisit_Core (in=_inDaysToEvent)
        TN_SID_2005_Core (in=_inSID)
        TN_SID_2006_Core (in=_inSID)
        TN_SASD_2005_Core (in=_inSASD)
        TN_SASD_2006_Core (in=_inSASD)
        TN_SEDD_2005_Core (in=_inSEDD)
        TN_SEDD_2006_Core (in=_inSEDD)
        end=lastObs;
  by KEY;
  if _inSID  or _inSASD or _inSEDD;

  ** flag events with the specified service;
  array prCcs {*} prCcs1-prCcs30;
  do i = 1 to dim(prCcs);
    if prCcs{i} eq &servX then do;
      servX = 1;
      leave;
    end;
  end;

  array cptCcs {*} cptCcs1-cptCcs30;
  do i = 1 to dim(cptCcs);
    if cptCcs{i} eq &servX then do;
      servX = 1;
      leave;
    end;
  end;

  ** service type indicator;
  select;
    when (_inSID)  servSetting = 'IP';
    when (_inSEDD) servSetting = 'ED';
    when (_inSASD) servSetting = 'AS';
    otherwise;
  end;

  ** counters;
  retain events 1;
  if _inSID then sidEvents = 1;
  if _inSEDD then seddEvents = 1;
  if _inSASD then sasdEvents = 1;
run;


** sort the combined events into visitLink (patient), service sequence order;
proc sort data=TN_AllEvents out=TN_OrderedEvents (index=(servX));
  by visitLink DaysToEvent;
run;
```

Usage Example #3: Preceding Visits to any Hospital Setting for Selected Patients (cont'd)

```
** find people who received the topic service;
proc sql;
  create table TN_TopicPop as
    select visitLink,
           min(DaysToEvent) as firstService
    from TN_OrderedEvents
    where servX eq 1
    group by visitLink;
quit;


** for people with the service, select all events prior to the service;
data TN_PriorEvents;
  merge TN_OrderedEvents (in=_inEventData)
        TN_TopicPop (in=_inTopicPop);
  by visitLink;
  if _inTopicPop;
run;


** summarize prior events by primary diagnosis and setting;
title 'Count of patients by Primary Diagnosis and Service Setting';
proc tabulate data=TN_PriorEvents format=comma12.;
  class dxCcs1 servSetting;
  format DXCCS1 FDCCSPDX.;
  var events;
  table (all DXCCS1),
        (all servSetting)*(events*sum);
run;
```

Usage Example #3: Preceding Visits to any Hospital Setting for Selected Patients (cont'd)

Output

Count of patients by Primary Diagnosis and Service Setting

		servSetting			
	All	AS	ED	IP
	events	events	events	events
	Sum	Sum	Sum	Sum
All	613,541	87,348	292,336	233,857
CCS: principal diagnosis				
1: Infectious and Parasitic DX	8,351	273	6,726	1,352
2: Neoplasms	27,723	24,110	221	3,392
3: Endocr, Nutri, Metab, Immun DX	7,074	1,626	3,095	2,353
4: Dx of Blood, Blood-Forming Organs	2,689	416	1,510	763
5: Mental Disorders	8,004	216	5,939	1,849
6: Dx of Nervous System, Sense Organs	46,362	9,754	34,891	1,717
7: Dx of Circulatory System	72,483	13,626	18,290	40,567
8: Dx of Respiratory System	59,376	7,848	43,290	8,238
9: Dx of Digestive System	30,309	5,802	18,551	5,956
10: Dx of Genitourinary System	17,253	3,260	11,766	2,227
11: Complic Preg, Birth, Puerperium	15,170	2,244	4,302	8,624
12: Dx of Skin and Subcutaneous Tissue	8,553	826	6,626	1,101
13: Dx of Musculoskel, Connective Tissue	25,937	6,453	16,583	2,901
14: Congenital Anomalies	2,098	917	180	1,001
15: Perinatal Conditions	145,485	810	3,227	141,448
16: Injury and Poisoning	90,679	3,639	79,694	7,346
17: Other Conditions	45,995	5,528	37,445	3,022